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YPLSF

United States Department of Agriculture
Agricultural Research Service
Pacific West Area
800 Buchanan Street
Albany, California
94710

May 14, 1990

U. S. Environmental Protection Agency
1200 Sixth Avenue
Seattle, Washington 98109
Attn: Super Fund Division
Ms. Debbie Robinson
RM. HW-112

DRAFT PROJECT PLAN FOR DISPOSAL OF HAZARDOUS WASTE SEPTIC SYSTEM, YAKIMA, WA

Dear Ms. Robinson:

The Agricultural Research Service (ARS) is pleased to provide a copy of the draft project plan develop by Hong West and Associates, P.O. Box 596, Lynnwood, Washington 98048, to execute the approved Resource Conservation and Recovery Act (RCRA) "Clean Closure" at Yakima Agricultural Research Laboratory, 3706 West Nob Hill Road, Yakima, Washington.

This project is the result of ARS' efforts to identify potential hazardous waste sites at our Locations under authority of Section 3916 of the Resource Conservation and Recovery Act (RCRA); Section 120 of the Comprehensive Enviromental Response, Compensation , and Liability Act (CERCLA); and Executive Order 12580.

By my earlier letter (to Bill Adams), I had invited you to participate in this project. This draft project plan is being provided you to give you an opportunity to review it and comment, if you choose.

ARS invites you to assume an active role in this project--particularly in reviewing the sampling-and-analysis plan. If you wish to participate in reviews or observe any portions of the contractor's work, please let me know at least a week in advance. Regardless of the role you choose now, your office will be sent a copy of the final report for review and concurrence.

If you have any questions or wish additional information, please do not hesitate to contact me. I can be reached at 415-559-6004.

Sincerely,

ALVIN HUMPHREY
Area Safety and Health Manager

cc:
G. Sundstrom, ES, GSD/SHPS, Greenbelt
L. Countee, CO, CAD, Greenbelt
R. Abeyta, ACO, Albany

WRI 595

DISPOSAL OF THE HAZARDOUS WASTE SEPTIC SYSTEM, IN YAKIMA, WASHINGTON:

PROJECT PLAN

DRAFT

PREPARED BY:

HONG WEST AND ASSOCIATES

APRIL 23, 1990

DRAFT

HONG WEST & ASSOCIATES

• Geotechnical Engineering • Hydrogeology • Materials Testing • Construction Inspection •

April 27, 1990

Lyndia Countee, Chief
Service Contracts Section, CAD
6303 Ivy Lane, Room 762
Greenbelt, MD 20770-1433

Re: Draft Project Plan Submittal
Contract No. 53-3K06-0-24
Disposal of the Hazardous Waste Septic System
Yakima, WA

Dear Lyndia:

Attached please find Hong West & Associates' draft Project Plan for the above-referenced project submitted for your review and comment. The draft Plan consists of a task-by-task description of the project, a Project Schedule, Health and Safety Plan and Sampling and Analysis Plan.

During final review of the RFP, Closure Plan and our Technical proposal, we noticed that the RFP did not request analyses of soil samples (under Task 9) for organophosphate insecticides (EPA Method 8140), even though high concentrations of these chemicals were found in the previous investigation. Therefore we propose to add two 8140 analyses to Task 9, consisting of two composites of the eight tank pit samples. This would produce additional relevant information, and the composite sample approach would minimize the additional cost impact.

Our schedule indicates that the final Project Plan is due for submittal June 4, 1990. We are requesting that specific comments/questions addressing the draft Plan be returned to Hong West & Associates no later than May 15, 1990.

Sincerely,

Larry West

HONG WEST & ASSOCIATES

Larry West,
Principal Groundwater Geologist

cc: Nancy Comstock, USDA
Alvin Humphrey, USDA
George Sundstrom, USDA
Stuart Cohen, Biospherics, Inc.
Dennis Goldman, Sweet-Edwards/Emcon

P.O. Box 596, Lynnwood, Washington 98046 • (206) 774-0106

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i. Project Scope

The purpose of the project, Disposal of Hazardous Waste Septic System in Yakima, Washington, is to remove an existing Septic Tank System formerly used for the disposal of various agricultural research chemicals.

The overall goals of the project are to eliminate the USDA's liability for past pesticide disposal practices at the Yakima Agricultural Research Laboratory (YARL) and provide substantiating data to support delisting of the site from the National Priority List (NPL). The principal objective in achieving these goals is the successful implementation of the RCRA Closure Plan presented in the solicitation.

The Hong West Team has studied the Plan in detail. Due to the on-site investigations we have conducted at the YARL over the last two years we are familiar with the site conditions and the problems associated with the site. Based on our in-depth understanding of the problem and site conditions, proper implementation of the RCRA Closure Plan should achieve the USDA's goals and *achieve and demonstrate "clean closure" of the septic system in accordance with Subpart G of 40 CFR 265.*

Our Project Plan includes all of the elements outlined or detailed in the solicitation and RCRA CLOSURE PLAN. We have included all the text from the solicitation (Section C.7 through C.12-5.7 and Section D.1, D.2) describing specific scope of work elements.

In essence, RCRA "Clean Closure" means that all hazardous waste and hazardous waste residues will be removed from the facility. Background soil and groundwater values, based on a sampling of an uncontaminated type area (having characteristics similiar to those of the contaminated areas) will be obtained and tested. Then it must be established that there has been no statistically significant increase in contaminant levels over background soil and groundwater values for all hazardous constituents.

Closure certification includes submission to the US EPA Region 10 Administrator, by registered mail, a certification that the facility has been closed in accordance with the specifications in the approved closure plan. The certification will be signed by the facility operator (USDA) and by a Hong West Team professional engineer licensed in the State of Washington.

Post-Closure certification includes submission to the US EPA Region 10 Administrator, by registered mail, a certification that the post-closure care period for the facility was performed in accordance with the specifications in the approved post-closure plan. The certification will be signed by the facility operator (USDA) and by a Hong West Team professional engineer licensed in the State of Washington.

Based on the Post-Closure certification and the supporting documentation (i.e. risk assessment, water quality data etc.) indicating that the facility does not pose a threat to health and the environment, EPA should remove the facility from the National Priority List. This process may include a reevaluation of the site by EPA or EPA subcontractors incorporating the data and information developed during the closure and post closure activities.

ii. Procedural Elements

The Hong West Team's management approach is structured specifically to ensure good coordination with all involved personnel, institutions and entities. Our management approach includes the following elements which will facilitate project coordination:

- o Ultimate responsibility for coordinating all project activities rests with Larry West, Project Director.

- o Day to day communications with USDA Maryland will be handled by Stuart Cohen, Deputy Project Director, who is also located in Maryland and has worked with USDA staff in the past

- o Each of the Project Tasks has been assigned a TASK MANAGER, responsible for the conduct and coordination of all elements of a single task. This approach works well in complex projects and ensures that task coordination rests with a single individual directly responsible to the project director.

- o USDA/ARS key personnel are as follows:

  Lyndia Countee, Contracting Officer
  Alvin Humphrey and Nancy Comstock, Contracting Officer's technical representatives, (Phases 1 and 2 of project, respectively)
  George Sundstrom, Contracting Officer's representative (health and safety)
  Rita Abeyta, Administration of Contract (receive reports and invoices)
  Nancy Comstock will also function as the day-to-day contact at the Project location in Yakima.

- o When possible YARL staff will be notified at least one week prior to any on-site activity by the Project Director. YARL staff **will be notified 24-48 hours prior** to any on-site activities by the Task Manager or the Project Director.

In the performance of the required work, the Hong West Team shall be responsible for complying with all applicable Federal, State, and local regulations, codes, standards, etc. It is anticipated that these requirements will include, but not be limited to, CERCLA, as amended by the Superfund Amendments and Re-Authorization Act of 1986 (SARA); RCRA, as amended by the Hazardous and Solid Waste Amendments of 1984 (HWSA); the regulations implementing CERCLA, SARA RCRA, and HWSA; the Department of Transportation regulations codified principally at 49 CFR 171-179; 29 CFR 1910.120; and Washington State equivalents. Where one is more stringent than another on a particular point, the more stringent shall apply.

The required work shall be performed in strict conformance with the approved project, sampling and analysis, and site safety plans. Any variation, including changes in subcontractor(s), shall be subject to prior approval by the Contracting Officer.

iii. Project Objectives

The objectives of this RCRA closure are to achieve and demonstrate "Clean Closure" of the septic system in accordance with Subpart G of 40 CFR 265. In support of the project objective, post-closure monitoring and other activities will be conducted to assess the existence of environmental contamination requiring additional remediation.

The Hong West Team shall identify and furnish all necessary personnel, labor, material, equipment, safety gear, and services to accomplish the project objectives.

If project findings make modification of the objectives, the closure plan, and/or the post-closure monitoring program necessary, the Hong West Team shall prepare and propose technically-adequate modifications of the Closure Plan for EPA, WDOE and ARS approval.

If the nature or extent of soil or ground water contamination necessitates further remedial action under CERCLA, the Hong West Team may, at the option of ARS, be directed to prepare a CERCLA Remedial Investigation/Feasibility Study report consistent with 40 CFR 300.68(d).

SECTION II

In this section, each Task of the project plan is discussed in detail. This RCRA closure and monitoring project is complex and will require the performance of several work elements simultaneously, by several different members of the Project Team. For this reason a Task Manager has been assigned to each work element (or Task). Of critical importance to successful implementation of the Project Plan is the establishment and maintenance of the Project Schedule.

The following section is a Task-by-Task summary of the Project Plan, complete with a listing of the Task Manager, Activities, Team Members and Schedule. The Schedule is based on the project initiation date of April 3, 1990, and elapsed time, in calender days, from that date. The schedule for initiation and completion for each Task is listed; the overall Project Schedule is presented graphically in Appendix C.

Signicant Project Milestones are as follows:

4/23/90 *Critical Data Gap Analysis summary report submittal*

4/30/90 *Draft Project Plan submittal*
Site Safety Plan
Site Sampling and Analysis Plan

6/3/90 *Final Project Plan submittal*
Uppermost Aquifer Assessment completed

6/29/90 *Tank Removal Operations completed*

8/3/90 *Closure Certification*

8/13/90 *Monitoring Well Construction completed*

9/3/90 *Quarterly Monitoring Report*

12/3/90 *Quarterly Monitoring Report*

3/3/91 *Quarterly Monitoring Report*

6/3/91 *Quarterly Monitoring Report*

9/3/91 *Quarterly Monitoring Report*

10/3/91 *Final Report and Post-Closure Certification*

TASK 1 - CRITICAL DATA GAP ANALYSIS

The Hong West Team shall review the approved closure plan, existing reports, records and regulatory agency correspondence/comments to ensure that all critical data gaps related to meeting the project objectives are addressed. Our analysis will involve general information-gathering activities, including reviewing DOE records of area water supply wells, review of active or inactive solid or hazardous waste disposal sites, local water purveyor's records review and a traverse of the site area for use in scoping of Task 4 and 6 activities.

Anticipated critical data gaps include the need for additional downgradient groundwater monitoring wells, an area well survey, additional drainfield soil sampling and establishment of acceptable "background" soil sampling locations and depths.

In addition to the above, our analysis will address the explosivity of the tank contents, background soil/water quality and the nature of groundwater flow direction and whether groundwater flow is "natural" or influenced by off-site factors, such as pumping, irrigation, artificial recharge or other boundary effects (critical to Task 4).

If unforeseen critical data gaps are found, the Hong West Team shall make and justify a recommendation to the CO for additional work elements. The completed Critical Data Gap Analysis shall consist of a brief (3-4 page) summary report.

Task Manager - *Doug Geller*

Activities - *Visits to Yakima for file and records review, site visit, report review, meetings and preparation of summary report.*

Team Members - *L. West, S. Greene, D. Geller (HWA)*

- *Sweet-Edwards/Emcon, Dennis Goldman, Gerritt Rosenthal, John North, Denise Mills*

- *Biospherics, Stuart Cohen*

Schedule - *20 days; Report submitted 4/23/90*

TASK 2 - PREPARE PROJECT PLAN

(discussion of this Task is omitted for obvious reasons)

Task Manager - *Larry West*

Activities - *Review Critical Data Gap Analysis, HWA Technical Proposal and approved closure plan; meetings and preparation of Draft and Final Project Plans.*

Team Members - *L. West, S. Greene, D. Geller (HWA)*

- *Sweet-Edwards/Emcon, D. Goldman, Gerritt Rosenthal*

- *Biospherics, Stuart Cohen*

Schedule - *25 days; Draft Plan submitted 4/30/90*

- *60 days; Final Plan submitted 6/3/90*

TASK 3 - PREPARE SAMPLING AND ANALYSIS PLAN

(SAMPLING AND ANALYSIS PLAN IS IN APPENDIX B)

Task Manager - *Stuart Cohen*

Activities - *Establish standard field sampling procedures, schedule and order of sampling events and QA/QC criteria. Modify existing site specific sampling and analysis plan.*

Team Members - *L. West, D. Geller, P. White (HWA)*

- *Biospherics, Stuart Cohen*

- *Sweet Edwards/Emcon, D. Goldman, J. North, D. Mills*

Schedule - *Sampling and Analysis Plan included as Appendix to final Project Plan. Draft Sampling and Analysis Plan submitted in 25 days (4/30/90)*

TASK 4 - UPPERMOST AQUIFER ASSESSMENT

This task includes 3 distinct subtasks:

Subtask 4.1 - Beneficial Use Inventory
Subtask 4.2 - Develop Conceptual Groundwater Model
Subtask 4.3 - Design Post Closure Monitoring Program

Subtask 4.1 - Beneficial Use Inventory: Additional information on the volume, spatial distribution, and hydrological effect of water withdrawals from the uppermost and lower aquifers within a one-mile radius of the septic system shall be collected and analyzed. The effect of irrigation, other water uses, and natural and artificial aquifer recharge on water table levels and hydraulic gradients in the vicinity of the septic system shall also be assessed.

The Hong West Team approach will include:

- *Research of WDOE files for well logs, water rights etc.*
- *Interviews with local irrigators, water purveyors and drillers.*
- *Access of National Water Well Association's Well-Fax files for well locations by zip-code (based on most recent census data).*
- *Field reconnaissance of area within a mile radius of the site and well owner survey/interviews.*
- *Preparation of large scale map showing points of beneficial use (i.e. wells) and potential contamination receptors.*
- *Preparation of well/withdrawal inventory based on available data or reasonable estimates of water usage.*
- *Evaluation of climate data and estimation of local recharge rates.*

Subtask 4.2 - Develop Conceptual Groundwater Model: Based on the data collected in Subtask 4.1, the previous site investigation and the results of the field and laboratory activities of this investigation, the Hong West Team will develop a comprehensive and detailed conceptual groundwater model illustrating the hydrodynamics at the YARL site. The conceptual groundwater model will serve 3 primary functions:

- *Provide a hydrogeologic foundation for the risk assessment.*

- *Identify any significant data gaps which might influence or hinder a representative risk assessment.*

- *Provide a foundation for developing a post-closure monitoring program.*

The conceptual groundwater model will include:

- *o Estimates of vadose/unsaturated zone permeability.*
- *o Subsurface cross sections illustrating the hydro-stratigraphy beneath the site.*
- *o Potentiometric maps showing the direction of ground-water flow beneath the site.*
- *o Estimates of the rate of groundwater flow beneath site.*
- *o The influence of nearby groundwater development/control*
- *o If indicated, possible or probable contaminant migration and schematic illustration.*
- *o Aquifer inter-relationships (hydraulic connection and recharge/discharge), beneath site, and if possible, regionally.*
- *o Groundwater quality characterization, background and beneath site.*

A preliminary conceptual groundwater model will be developed prior to any on-site drilling activities. This preliminary model will be used in selecting the location of drill sites. A final conceptual groundwater model will be developed based on drilling and post-closure monitoring data for use in the risk assessment.

Subtask 4.3 - Design Post Closure Monitoring Program: Based on the information developed in Task 1 - Critical Data Gap Analysis, Task 3 - Sampling and Analysis Plan and the preliminary conceptual groundwater model developed in Task 4.2 we will design the post-closure monitoring program. The design will specifically address:

- o What to Monitor?
- o Where to Monitor?
- o When to Monitor?
- o How to Monitor?

Monitoring program design will adhere to and cite the guidelines of the RCRA Technical Enforcement Guidance Document and/or WDOE guidelines whichever is more stringent.

Task Manager - Doug Geller

Activities - groundwater mapping, geologic cross sections, interpretation of hydrostratigraphy, soils permeability testing, well-log survey and map preparation

Team Members - D.Geller, L.West, D.Howard, S.Greene (HWA)

- Sweet-Edwards/Emcon, D. Goldman, J. North, D. Mills

Schedule - 60 days (6/3/90)

TASK 5 - DEVELOP SITE SAFETY PLAN

Under this task The Hong West Team will modify the site health and safety plan developed and submitted to USDA in May 1988 for the initial YARL investigation. The proposed Site Safety Plan is included in Appendix A. The principal elements of the site safety plan will include:

- o Hazard Evaluation
- o Monitoring Requirements
- o Hazard action levels
- o Level of Protection
- o Work Limitations
- o Authorized Personnel Responsibilities and Training
- o Emergency Response
- o General Requirements

The general requirements to be included in the site safety plan are:

Equipment for Closure and Handling of Wastes: Hand tools, backhoes, safety equipment, trucks, spill response equipment, and other necessities for the safe clean closure of this facility shall be identified, provided, brought on site, and checked for proper operation in a manner timely to that day's activities. All equipment shall be used or operated in a safe manner by qualified individuals. Safety equipment includes that required to implement an approved site safety plan that complies with 29 CFR 1910.120. Spill response equipment, including absorbent materials and compatible drums, shall be present on site during all operations.

Disposal or Decontamination of Equipment, Structures, and Soils: Contaminated items shall either be decontaminated onsite or containerized for offsite treatment/disposal at a RCRA-permitted incinerator or landfill. Offsite shipment of hazardous waste shall be by a licensed hazardous waste hauler and be manifested. If containerized, containers shall be properly selected, marked, labeled, and managed. Decontamination measures shall be specified in detail in the approved site safety plan developed for the project. Copies of manifests shall be provided to the COR as discussed in Task 7 - Remove and Dispose of Septic Tank Contents.

Spills and Environmental Contamination: Affirmative measures shall be adopted and implemented as necessary to prevent, minimize, contain, control, and/or clean up as rapidly as possible any actual or potential releases to the environment of hazardous substances, hazardous waste, or contaminated materials during or as a result of work under these specifications. These activities will be identified in the site safety plan and conducted in a manner consistent with the plan and other applicable Federal and State requirements. The Hong West Team's task manager or site safety manager will obtain photographic documentation of the location of any of the above mishaps.

Environmental Monitoring: Consistent with the Agency for Toxic Substances and Disease Registry's recommendation for this site, air sampling shall be performed before, during, and after removal operations. This recommendation shall be incorporated in the project and site safety plans. The Hong West Team shall execute such appropriate routine and contingency site monitoring as may be necessary to measure/monitor emissions of contaminants to air, water, and soil and to ensure

employee and public safety. The specific location of air sampling stations shall be determined by meteorological conditions during site operations. Emergency and evacuation procedures in the event of air releases shall be included in the site safety plan.

Site Security: An adequate level of site security shall be identified, provided, and monitored during all phases of the closure and post-closure activities. This applies to maintaining the operational security and integrity of monitoring wells and equipment as well as minimizing the likelihood of personal injury or environmental damage. Site security shall be discussed in the project and site safety plans. The Hong West Team will provide a lockable project trailer during the major on-site activity period (approximately 50-120 days after award). The trailer will provide a secure place to store project equipment.

Accidents and Releases: The Hong West Team shall notify the CO and/or COR at the time of occurrence or discovery of any accident, injury, unauthorized access, vandalism, release of hazardous substances, or other unusual events or circumstances, or as soon afterward as possible. ARS will notify EPA and WDOE. The Hong West Team's task manager or site safety manager will obtain photographic documentation of the location of any of the above mishaps.

Based on the available data we anticipate that most of the work on site will be performed under level D and modified C protection (modified C defined as level C equipment sans chemical suit and respirator on or within immediate reach). At present we anticipate septic tank sampling will be performed in Level B protection and tank removal will be performed in level B protection, pending results of tank contents analysis.

Site access will be restricted during any field activities using barracades around the immediate work area. During environmentally sensitive operations such as tank sampling or removal, air quality will be monitored using an HNU photoionization detector. Non project related personnel will be kept away from the activities with tape cordon and gentle persuasion from our very big, menacing looking on-site supervisor/safety manager. Drilling activities will be cordoned off.

If routine monitoring outlined in the safety plan indicates a change in hazard level, a predetermined action program, also outlined in the safety plan, will immediately be initiated and the Project Safety Officer notified.

Task Manager - *Dale Berndt (Sweet Edwards/Emcon)*

Activities - *Review 5/88 Plan; identity hazards associated with tank removal; modify plan as ncessary*

Team Members - *S. Greene, L. West*

Schedule - *Site Safety Plan will be included as an Appendix to draft and final Project plans (4/30/90 and 6/3/90)*

TASK 6 - RISK ASSESSMENT

To document closure success and the appropriateness of terminating post-closure monitoring, a quantitative risk assessment shall be prepared, using the methodology, assumptions, and criteria contained in Office of Solid Waste and Emergency Response (OSWER) Directive 9502.00-6D (EPA Publication EPA 530/SW-89-031), or equivalent.

This task includes 3 subtasks:

Subtask 6.1 - Develop Action Levels
Subtask 6.2 - Develop Risk Model
Subtask 6.3 - Perform Risk Analysis

Subtask 6.1 - Develop Action Levels: Action levels are derived below for several priority pesticides. The process and assumptions are described. thus, if additional priority analytes are detected in the planned monitoring effort, additional action levels will be calculated using the same process and assumptions.

Soil vs. Ground Water - No pesticides or other organics have been detected in ground water at the site. Therefore, no drinking water action leveles are proposed at the present time. If they do become necessary, EPA's drinking water Health Advisory Levels or MCLs are available for many pesticides and will be used.

Land use at the site will likely change significantly over the next several years. Future residential use is being assumed, with a target population of children and exposure through soil ingestion. Other target populations and exposure routes are assumed to be less important or negligible.

Soil Ingestion Factors - The following factors are based on EPA's most current assumptions (J. Schaum, Exposure Assessment Group, ORD/EPA personal communication, 4/24/90).

AGE	SOIL INGESTION	AVERAGE WEIGHT
1-7 years	0.2 gm/day	17 kg
>7 years	0.1 gm/day	70 kg

Priority Chemicals - The following pesticides were selected for the initial soil action level calculations based on high concentrations in the septic tank or frequent detections at the site and one or more of the following criteria: moderate to high mobility, persistence or toxicity.

Acceptable Body Burdens - The Reference Doses (RfDs) and carcinogenic potency factors (Q*s) were obtained from EPA's Reference Dose Tracking Report, August, 1989, and EPA's Integrated Risk Information System (IRIS):

* Endosulfan ---------- RfD (1987) = .00005 mg/kg/day

* DDD/DDT ---------- RfD (1985) = .0005 mg/kg/day

$$Q^* = .34X10^{-1} \text{ (mg/kg/day)}^{-1}$$

* Lindane ---------- RfD (1986) = .0003 mg/kg/day

* Disulfoton ---------- (in progress)

* Chlopyrifos (Dursban) — RfD = .003 mg/kg/day

* 2,4 D ---------- RfD = .01 mg/kg/day

Action Level Calculations - Soil action levels were calculated for years 1-7 only, since adult exposures are considered negligible (see "Soil Ingestion Factors" above). Actions levels for noncarcinogenic effects are calculated as follows:

Action level (ppm) = RfD X (17 Kg/0.2 gm soil/day) X 1000 ug/mg

Action levels for carcinogenic effects are calculated as follows:

Action level (ppm) = $(1X10^{-6}/Q^*)$ X (17 kg/0.2 gm soil/day) X 1000 ug/mg

COMPOUND	ACTION LEVEL
Endosulfan	4.25 ug/gm (ppm)
DDD/DDT	42.5 ppm noncarcinogenic effects
	2.5 ppm carcinogenic effects
Lindane	25.5 ppm
Disulfoton	in progress
Chlopyrifos	255 ppm
2,4 D	850 ppm

Other actions levels will be proposed if new monitoring data indicate the need.

Subtask 6.2 - Develop Risk Model: Following determination of characteristics or indicator species of concern, the various pathways and modes of exposure will be determined (from conceptual groundwater model). Modeling of potential risk will develop ranges of estimated risk based on the most sensitive mode and/or population exposed for each pathway. In the event that significant uncertanties in pathways, modes or populations exist (e.g. in exposure concentration, direction of migration,

population, etc.) analysis may require development of either a stochastic model to account for the uncertainty or the use of a "worst case" - "worst reasonable case" - "best estimate" approach to develop exposure values and their estimated uncertainties.

Subtask 6.3 - Perform Risk Analysis: Based on the soil and water quality data as primary input to the risk model we will determine what if any action levels are reached and if there is a threat to health and the environment.

Task Manager - *Gerritt Rosenthall (Sweet Edwards/Emcon)*

Sub-Task 6.1 - *Stuart Cohen (Biospherics)*

Activities - *evaluate data; identify contaminants of concern; propose action levels; negotiate with DOE and EPA*

Team Members - *D. Geller, D. Goldman, L. West*

- *Biospherics (Stuart Cohen)*

Schedule - *to be performed throughout duration of project. Risk Model will be included in Closure Certification Report. Final Risk Analysis included in Final Report.*

TASK 7 - REMOVAL AND DISPOSAL OF SEPTIC TANK CONTENTS

The Hong West Team shall collect one representative sample each (plus appropriate QA/QC samples) of the floating solids, liquid phase(s), and sludge in the septic tank to confirm previous analyses for extraction-procedure toxics (pesticides and metals) and to determine if the contents of the septic tank are hazardous waste. For purposes of this SOW, it is assumed that the entire contents (approximately 300 gallons) will be found to be hazardous waste. After the analytical results are obtained, the services of a licensed hazardous waste transporter shall be used to remove the entire contents of the tank to a RCRA-permitted incinerator (treatment) or landfill (disposal) facility. The removal may be in containerized (i.e. drums) or bulk (vacuum truck) form. This step will achieve source control. If feasible, a triple rinse of the inside of the septic tank shall be performed. This step may be taken while the tank is in place or after it has been removed from the ground. The rinsate shall be treated/disposed offsite as a hazardous waste. A copy of any hazardous waste manifest(s) for the outgoing shipment(s) shall be provided to the COR, as shall signed copies of any manifest(s) returned by the RCRA facility or facilities treating or disposing of the waste.

The representative sample of floating solids, liquid phase and sludge will be taken from the septic tank per regulations defined in SW 846 and 40 CFR 261 - Appendix 1.

Laboratory blanks, laboratory controls, spikes and duplicates will be provided by the Hong West Team for QA/QC purposes as per the sampling plan developed in Tasks 2 and 3.

Analyses will include:

Test Description	*Matrix*	*Quantity*

EP Toxicity: Metals, Pesticides, Herbicides and Extraction	*s/s/s*	*3*
Reactivity, Corrosivity and Ignitability	*s/s/s*	*3*
Total Metals	*Rinsate*	*1*
Pesticiaes: 8080, 8140 and 8150	*Rinsate*	*1*

All samples to be analyzed by RCRA SW 846 methodologies and reported as EP Toxicity Compounds. Verbal results supplied in 5 business days. Second column confirmations for pesticides and herbicides supplied in 10 business days. Written report of results provided in 4 weeks (Refer to Appendix B, Sampling and Analysis Plan for complete analytical procedures explanation).

Because of the probable presence of wastes banned from land disposal without prior treatment per 40 CFR 268.7 (a) (commonly called "F listed wastes") such as toluene and xylene, the waste and rinsate from the septic tank will have to be disposed of via prior treatment or incineration. Treatment and/or incineration will be at a RCRA-permitted TSD (treat, store, dispose) facility who will "sign off" on the material, thus becoming in effect the generator of the waste, eliminating long-term U.S.D.A. hazardous waste liability.

The tank has an expected capacity of only 300 gallons. Therefore, the waste will be pumped into D.O.T. 17 E hazardous waste disposal drums. This will be more cost effective than using a vacuum truck. There will also be less chance of leaks and spills than if we used a vacuum truck. Our budget is based on a total of 12 drums of septic tank contents and rinsate.

After pumping the liquid and sludge from the septic tank, we can render the tank non-hazardous by triple rinsing it with 1/3 of its total volume. This will leave us with a total of 300 gallons of rinsate plus the amount of waste that is currently in the septic tank. The rinsate will be handled the same as the waste contained in the septic tank.

Depending upon the results of the final analysis of the contents of the septic tank, this waste will be taken to one of the following TSD facilities:

Sol-Pro, Inc.
P.O. Box 1781
Tacoma, WA 98401

Telephone (206)627-4822
EPA #WAD027543032

Chem-Pro
2203 Airport Way South
Suite 400
Seattle, WA 98134

Telephone (206)223-0500
EPA #WAD000812909 (Lucille Street Facility)

Chemical Waste Management, Inc.
200 S.W. Market Street
Suite 295
Portland, OR 97201

Telephone (503)221-1912
EPA #ORD089452353

Whatever TSD facility is used, the disposal process is the same and consists of the following steps:

1. Collect and analyze sample of waste as explained above.

2. Send analysis and representative sample of waste to TSD facility with a completed "Waste Material Profile Sheet" (different titles for this sheet are used by different TSD facilities). This sheet will have waste classification information per analysis results.

3. After waste has been accepted for disposal, drums are labeled with 4" diamond classification labels (two labels on side of drum and one on the top) and 6" yellow D.O.T. Hazard shipping labels explaining shipping name and hazard information for the waste being shipped. Drums are then painted with "up" arrows, profile numbers and drum numbers.

4. Shipment dates are set with TSD facility and waste is transported by a licensed hazardous waste transporter. When transported, the waste is manifested, with the manifest signed by the transporter and representative of the generator. The generator retains one copy of the manifest at time of shipment plus receives the original at the time of disposal. This is the generator's record of proper waste disposal.

TASK 8 - EXCAVATE AND REMOVE SEPTIC TANK

After the tank has been emptied of its liquid and solid contents, the Hong West Team shall remove the septic tank from the ground and dispose of offsite appropriately. As noted in Task 7, the Hong West Team shall, if feasible, triple rinse the septic tank to render it nonhazardous and subject only to solid waste disposal requirements to satisfy a waste minimization objective. Immediately after the tank is pulled from the ground, the Hong West Team shall closely inspect the outside of the tank for damage, cracks, and possible leaks. The side walls and floor of the pit where the tank has been located shall also be closely examined for evidence of contamination (e.g., discoloration, staining, odors, etc.). Any obvious contamination shall be containerized in 55-gallon drums or stockpiled for bulk shipment to a RCRA-permitted facility for treatment (incineration) or disposal (landfill). Photographic documentation of the location of the samples and the condition of the pit shall be produced at the time the septic system is excavated.

The tank is not metal, therefore we will not be required to evacuate the vapor with dry ice, but we will test for organic vapors during the excavation process. This will be done as a safety precaution and for air monitoring records.

After the tank is pulled from the ground, the sides and floor of the pit will be inspected for evidence of contamination. All obvious contamination will be containerized in 55 gallon D.O.T. 17 E hazardous waste drums. We will use 55-gallon drums for shipment of contaminated soil, rather than bulk (dump trucks) because of the small amount expected (Our cost estimate is based on a total of 10 drums of soil disposal). If after testing the soil, there is a considerable amount to be disposed of at TSD facility, we will use dump trucks.

All profiling, labeling and manifesting procedures explained for section Task 7 pertain to soil disposal. Possible TSD facilities for disposal of contaminated soil are the same as those listed in Task 7.

One of the following licensed excavating companies will be used to excavate the septic tank and contaminated soil if there is a large amount:

Ken Leingang Excavating, Inc.
1117 North 27th Avenue
Yakima, WA 98902

Telephone (509)5507
License #KE-NL-EE-2010D

Sullivan Trucking and Excavating Company, Inc.
11555 Northup Way
Bellevue, WA 98004

Telephone (206)827-8761
License #SULLITE150LA

Task 7&8 Manager	*- Steve Greene*
Activities	*- Site Supervision during tank cleaning and removal operations/coordination of all field activities*
Team Members	*- D. Geller, L. West*
	- Sweet-Edwards/Emcon
	- Chem Safe Services
	- Biospherics
	- Excavation Subcontractor
	- Licensed Hazardous Waste Transport Subcontractor
Schedule	*- Tank contents disposal and tank disposal completed within 90 days (6/29/90)*

TASK 9 - ASSESS RESIDUAL CONTAMINATION AT SEPTIC TANK SITE

The Hong West Team shall collect eight soil samples (one from each quadrant of the pit bottom and two each from 1-2 feet above the bottom at the ends and sides of the hole), plus appropriate QA/QC samples, and analyze them for CERCLA hazardous substance list pollutants. Comparable soil samples shall be collected from corresponding depth/stratigraphic locations at one or more sites where pesticide application has not occurred in the past to assess background levels of the contaminants analyzed. The sample analyses shall be done at a certified commercial lab employing EPA-approved methods and CLP QA/QC measures. Photographic documentation of the location of the samples and the condition of the pit shall be produced at the time the septic system is excavated. After any apparent contamination is removed, samples are collected, and photos are taken, the pit shall be backfilled to existing grade with clean, compacted fill.

As discussed in SECTION 1 - UNDERSTANDING OF PROJECT the Hong West Team considers background soil quality a significant issue. Soil samples from an area of known or probable pesticide application (agricultural rates, i.e. an orchard) may be more representative of background soil quality for the Yakima area than comparable soil samples from sites where pesticide application has not occurred (this issue is dicussed in depth in our Critical Data Gaps summary report). At present we anticipate collecting two background samples from two separate locations using a hollow stem auger drill rig. (proposed locations of background sampling locations shown on Figure 2)

If adequate safety precautions can be established, we recommend the USDA consider leaving the tank pit open until pit samples have been analyzed. In the event additional soil must be removed a one week wait will yield a significant cost savings. Our schedule and budget allows for extra-fast turnaround on the soil samples from the pit.

The following samples will be collected: 3 background and 8 soil samples; 1 trip blank; 1 field decontamination and 1 wash water. All samples will be analyzed by CLP protocol and reported as TCL compounds. Verbal results supplied in 5 business days. Second column confirmations for pesticides supplied in 10 business days. Written report of results provided in 4 weeks.

Test Description	*Matrix*	*Quantity*
VOAs	*s/s/s*	*11*
Semi-VOAs	*s/s/s*	*11*
Pesticide/PCB	*s/s/s*	*11*
Metals	*s/s/s*	*11*
Cyanide	*s/s/s*	*11*
VOAs	*H20*	*3*
Semi-VOAs	*H20*	*2*
Pesticide/PCB	*H20*	*2*

Metals	*H20*	*2*
Cyanide	*H20*	*2*

Samples from the pit bottom and sides will be obtained with stainless steel utensils and/or hand augers. Comparable background site samples will be collected with a JMC zero contamination sampler and/or stainless steel augers.

Backfill will be pit run or tested fill whichever is most appropriate. Backfill will be supervised by a licensed construction inspector with experience in soils.

Task Manager - *Steve Greene*

Activities - *Field monitoring and sampling, chemical analysis of representative samples*

Team Members - *D. Geller*

- *Sweet Edwards/Emcon, D. Berndt, D. Ashcom*

- *Biospherics, S. Cohen*

- *Drilling Subcontractor*

Schedule - *Assessment completed within 100 days (7/09/90)*

TASK 10 - WASHDOWN PAD INSPECTION AND DISPOSAL

The Hong West Team shall closely inspect the washdown pad for evidence of contamination. If, as expected, none is evident, the concrete pad shall be broken up and hauled away as solid waste. If contamination is apparent, the Hong West Team shall propose a cost-effective means of decontaminating and/or disposing of the washdown pad.

We will inspect the washdown pad using a photoionization meter. If the washdown pad registers positive or shows visible signs of contamination it will be triple rinsed to render it non-hazardous. If it still contains evidence of contamination, that portion will be taken off by hand (jackhammer) and disposed of as a hazardous waste. The remainder of the pad will be broken up and any reinforcing metal cut with a hacksaw (we will avoid using a flame at this time). The pad will then be hauled to a local solid waste landfill.

(Task Manager, Activities, Team Members and Schedule identical to Task 9)

TASK 11 - ASSESSMENT OF RESIDUAL CONTAMINATION UNDER WASHDOWN PAD

The area beneath the washdown pad shall be closely inspected for evidence of contamination (e.g., discoloration, staining, odors, etc.). Any obvious contamination shall be containerized in 55-gallon drums or stockpiled for bulk shipment to a RCRA-permitted facility as described in Section C.10-1.

Four soil samples (one from each quadrant of the area beneath the washdown pad) shall be collected and analyzed for volatile organic compounds (VOC's), semivolatile organic compounds, organochlorine and organophosphorous pesticides, and total metals. After this work is done and photodocumented, the washdown pad area shall be restored to existing grade with appropriate materials properly applied. Photographic documentation of this activity will be provided.

At the time of visual inspection we will also conduct a photoionization survey of the area beneath the washdown pad. As with the tank pit residual contamination we recommend waiting for restoration until the soil samples have been analyzed.

The following samples will be collected: 4 soil; 1 trip blank; 1 field decontamination water; 1 wash water. All samples will be analyzed by SW-846 protocol and reported as TCL compounds. Verbal results including second column confirmations will be supplied in 2 weeks. Written report of results provided in 4 weeks.

Test Description	*Matrix*	*Quantity*
VOAs	*s/s/s*	*4*
Semi-VOAs	*s/s/s*	*4*
Pesticide/PCB	*s/s/s*	*4*
Metals	*s/s/s*	*4*
Cyanide	*s/s/s*	*4*
VOAs	*H20*	*3*
Semi-VOAs	*H20*	*2*
Pesticide/PCB	*H20*	*2*
Metals	*H20*	*2*

(Task Manager, Activities, Team Members and Schedule identical to Tasks 9 and 10)

FOR TASKS 7-11 AND TASK 15 (Principal Field Closure Effort), A SCHEDULE OF THE MINIMUM REQUIRED TIME AND EFFORT HAS BEEN DEVELOPED, AS FOLLOWS:

DAY	WORK EFFORT	(TASK)
1	*Prepare for field effort*	*(7)*
2	*Mobilize to site*	*(7)*
3	*Remove and dispose of septic*	

tank contents .....(7)
Rinse tank .....(8)

4.....Excavate/remove septic tank .....(8)

5.....Assess Residual contamination beneath
septic tank .....(9)
backfill tank excavation .....(15)

6.....Washdown pad inspection and
disposal .....(10)

7.....Assess residual contamination
beneath washdown pad ..... (11)
Final tank removal site restoration .... (15)

8.....Complete tank removal site
restoration .....(15)

9.....Demobilize .....(15)

TASK 12 - DRAINFIELD AREA SOIL SAMPLING

The Hong West Team shall collect six additional soil samples, plus appropriate QA/QC samples, from the septic system's drainfield. The samples shall be analyzed for VOC's, semivolatile organic compounds, organochlorine and organophosphorus pesticides, and total metals. The specific sampling stations shall be determined by random selection from a grid network of appropriate scale established over the areal extent of the drainfield. Samples shall be composites of soil collected from a depth of 6 feet to 9 feet or the cemented caliche layer, whichever is encountered first. If contaminant concentrations are found in excess of approved actions levels, the Hong West Team shall excavate, remove, and treat or dispose of the contaminated material at a RCRA-permitted facility. If they are comparable, the samples collected as backgrounds for the septic-tank excavation/removal shall be collected from an area where pesticide application has not occurred and be analyzed for the same parameters as the drainfield samples.

The Hong West Team will photograph the location and sampling process. Based on our previous experience at the site, obtaining samples of the caliche or material immediately below the drainfield line will require the use of a drill rig. Our budget and schedule allows for the advancement of 6 hollow stem auger holes for drainfield area soil sampling.

The following samples will be collected: 6 soil samples; 1 trip blank; 1 field decontamination and 1 wash water. All samples will be analyzed by SW-846 protocol and reported as TCL compounds. Written report of results provided in 3 weeks.

Test Description	*Matrix*	*Quantity*
VOAs	*s/s/s*	*6*
Semi-VOAs	*s/s/s*	*6*

Pesticide/PCB	*s/s/s*	*6*
Organophos. Pesticide	*s/s/s*	*6*
Metals	*s/s/s*	*6*
VOAs	*H20*	*3*
Semi-VOAs	*H20*	*2*
Pesticide/PCB	*H20*	*2*
Organophos. Pesticide	*H20*	*2*
Metals	*H20*	*2*

TASK 13 - MONITORING WELL INSTALLATION

At the approximate time that closure activities are conducted, one or more additional groundwater monitoring wells (MW's) and/or piezometers shall be constructed, completed and developed by the Hong West Team to supplement or replace one or more of the four (4) existing wells. The number and location of these wells and/or piezometers shall appear in the approved project plan and be based on the Hong West Team's professional knowledge and our analysis of piezometric surface maps prepared

from water level data collected from MW-A, MW-B, MW-C, and MW-D between June, 1988, and the initiation of work under this contract. Consultation with EPA and WDOE may be directed by the Government. The construction, completion, and development methods employed shall follow and be consistent with the RCRA Groundwater Monitoring Technical Enforcement Guidance Document. At least two of the total number of wells (existing and new) shall be hydraulically downgradient from the septic tank drainfield under any seasonal groundwater condition.

New monitoring wells shall be located as close as possible to the septic system/drainfield (Refer to Figure 2 for proposed new well locations). It is anticipated that the additional well(s) will be located a short distance east of existing MW-A. Surface aspects (guarding, height, etc.) of the well shall take into account the well's location. Core samples and drill cuttings shall be analyzed to fully characterize site geology, including the vadose zone. The horizontal and vertical control for each well/piezometer shall be surveyed to known benchmarks or reference points. Vertical control shall be within 0.01 feet. A qualified geologist, hydrogeologist, or geotechnical engineer shall supervise the construction and completion of all monitoring wells and piezometers. Drilling logs shall be maintained for all wells/piezometers. At least one log shall present continuous geological information.

Should geologic conditions permit, two of the wells will have limited screen lengths (1 to 2 feet) at discreet intervals in the uppermost aquifer. This paired piezometer method will aid in determining vertical hyrdraulic gradients within the aquifer.

The Hong West Team will photograph the monitoring well locations and the drilling, sampling and monitoring well construction process.

Actual number, locations and depths of the monitoring wells will be determined after a detailed review of the potentiometric data and development of the preliminary conceptual groundwater model. Based on our on-site experiences to date we anticipate the construction of two additional upper aquifer monitoring wells approximately 35'deep using hollow stem augers.

If the question of hydraulic connection between the uppermost aquifer and the next-lower aquifer cannot be resolved by routine analysis of existing well logs, local water supply company records, and other sources, at least one of the new wells and/or piezometers shall be constructed, or MW-B shall be modified, to allow such an assessment. A deep boring (100 to 150') is proposed in order to determine the possible existence of multiple aquifers below the site. A cable tool drill rig will be used for the deep hole.

The presence of at least one aquitard between the uppermost aquifer and lower aquifers has been deduced from previous site subsurface explorations. The thickness, lateral continuity and vertical permeability of the aquitard are the most significant factors in determining the risk of a lower aquifer to contamination from the uppermost aquifer. The Hong West Team's scope of work and budget provides for collection of an undisturbed sample of the aquitard(s) and triaxial permeability testing to obtain a representative value for the vertical permeability. We have also provided for grain size distribution tests to allow for estimating the vertical permeability of the vadose zone, and the hydraulic conductivity of the uppermost and underlying aquifers. These data (in addition to existing slug test data) will be critical in establishing a credible conceptual groundwater model for risk assessment.

If directed by the CO after the post-closure monitoring portion of this project, the Hong West Team shall remove all monitoring wells at this site in accordance with the more stringent of applicable provisions of the Groundwater Monitoring Technical Enforcement Guidance Document and applicable Washington State regulations.

Photographic documentation of any abandonment procedures will also be performed. Our proposed budget includes abandonment of the four existing monitoring wells and the three monitoring wells proposed under this task.

Pursuant to the RCRA Groundwater Monitoring Technical Enforcement Guidance Document (U.S. EPA OSWER-9950.1), the following information shall be recorded for each well in the detection monitoring system:
1

Date/time of construction
Drilling method/fluid used
Well location (within .5 ft)
Borehole diameter and well casing diameter
Well depth (within .1 ft)
Drilling and lithologic logs
Casing materials
Screen materials and design
Casing and screen joint type
Screen slot size and length
Filter pack material/size, grain analysis
Filter pack volume calculation
Filter pack placement method

1.

Sealant materials (% bentonite)
Sealant volume (lbs)
Sealant placement method
Surface seal design/construction
Well development procedure
Type of protective well cap
Ground surface elevation (within .01 ft)
Surveyor's pin elevation (within .01 ft)
Top of monitoring well casing elevation (within .01 ft)
Top of protective casing elevation (within .01 ft)
Detailed drawing of well (including dimensions)

A typical representation of a monitoring well is included in Appendix B, Sampling and Analysis Plan.

Tasks 12-14 Task Manager - Doug Geller

Activities	*- Monitoring well design, on-site drilling and well placement, well development. Soil borings and soil sampling*
Team Members	*- S. Greene*
	- Drilling subcontractor
	- Sweet Edwards/Emcon (Task 14), J. North, D. Mills
Schedule	*- Well completion: 80 days (6/22/90)*
	- Post-Closure monitoring: 450-500 days 7/91 to 8/91

~~TASK 14 - WELL MAINTENANCE/POST-CLOSURE MONITORING~~

Water levels in all monitoring wells and/or piezometers shall be monitored on a monthly basis to facilitate analysis of seasonal variations in hydraulic gradient. Well depth shall be measured on a monthly basis to observe any filling in or siltation of the well. Any structural or performance problems shall be corrected as soon after discovery as possible.

One year (5 rounds) of quarterly post-closure monitoring shall be initiated as soon after septic-tank closure as possible. The sampling and analysis shall be in accordance with the approved sampling and analysis plan. The first quarterly sampling round will begin at tank closure; four additional sampling rounds will be conducted in the following 12 months.

Sixty-one samples will be collected from 7 wells on 5 trips. Trip 1: (7 wells X 4 samples/well) + 1 trip blank = 29 samples. Trips 2-5: (7 wells X 1 sample/well X 4 trips) + 4 trip blanks = 32 samples. All samples will be analyzed by SW846 protocol and reported as TCL compounds. Written report of results provided in 4 weeks.

Test Description	*Matrix*	*Quantity*
VOAs	*H20*	*61*
Herbicides	*H20*	*56*
Pesticides	*H20*	*56*
Organophos. Pesticides	*H20*	*56*
Lead, Arsenic, Cadnium and Mercury	*H20*	*56*

Hong West Team members are currently monitoring the existing system at the YARL site. Our budget also includes repair of MW-D which has been damaged by traffic.

(see Task 13 for other Task information)

TASK 15 - SITE RESTORATION

The Hong West Team shall use clean fill or other appropriate materials to restore the work site to its former topography and/or required surface type. Fill shall be compacted to prevent settling and other problems. Six months after initial site restoration, the Hong West Team shall correct any deficiencies or settling that has occurred.

The Hong West Team shall properly dispose of all drilling spoils and other wastes generated during this project. If necessary, the Hong West Team shall obtain and use clean fill or other appropriate materials to restore the work site to its former topography and condition

Items contaminated with hazardous substances and/or wastes during the course of work on this project shall either be decontaminated onsite of containerized for offsite treatment and/or disposal at a RCRA-permitted incinerator or landfill. Offsite shipment of any hazardous wastes generated in the course of this project shall be by licensed hazardous waste haulers and be manifested. If containerized, containers shall be properly selected, marked, labeled and managed. Copies of any hazardous waste manifests shall be provided to the COR.

Photographic documentation of the before and after restoration conditions shall be produced at the time of restoration.

Task Manager - *Steve Greene*

Activities - *Final backfilling, debris removal, drill cuttings removal and site regrading*

Team Members - *Chem Safe Services*

- *Drilling Subcontractor*

Schedule - *Initial site restoration after monitoring well construction; final site restoration to include monitoring well closure.*

TASK 16 - CLOSURE/POST-CLOSURE CERTIFICATION

This task has been divided into 4 subtasks including:

Subtask 16.1 - Closure Inspection
Subtask 16.2 - Closure Certification
Subtask 16.3 - Post Closure Evaluation
Subtask 16.4 - Post Closure Certification

Subtask 16.1 - Closure Inspection: The Hong West Team shall notify the COR at least five (5) days before we begin the work described in *Tasks 7-12 (principal closure effort)*. At a minimum, site activities shall be observed and/or supervised in their entirety by the CO of COR, the Hong West Team's project or field manager or the professional engineer who will be certifying closure, and the Hong West Team's site safety officer. The Hong West Team shall conduct a detailed inspection of the site and any equipment used during operations before and at the close of each activity and/or work day, as appropriate, to ensure that mechanical problems, contamination, etc. are recognized and managed properly. If analyses are required to establish whether contamination has occurred, the Hong West Team shall take all reasonable actions to control/contain possible exposures or spreading of contamination. Decontamination wash/rinse waters shall be properly managed to prevent release to the environment.

Subtask 16.2 - Closure Certification: Within 60 days after completion of closure activities, the Hong West Team shall provide a closure certification by a professional engineer in accordance with 40 CFR 265.115. Inasmuch as a clean closure is expected, 40 CFR 265.116 and 265.117 are not anticipated to be applicable.

Subtask 16.3 - Post Closure Evaluation: Under this task the Hong West Team will evaluate the post closure monitoring data, and the results of the risk assessment to establish:

- o Did closure activities result in a "Clean Closure"?
- o Has any threat to the health and environment from the past site waste disposal activities been eliminated?
- o If a threat to the health and environment persists, what is the quantitative risk of that threat?

Subtask 16.4 - Post Closure Certification: If warranted by the results of post-closure monitoring *and the post-closure evaluation performed in Subtask 16.3*, the The Hong West Team shall prepare and submit a professional engineer's post-closure certification made in accordance with 40 CFR 265.120 within 60 days after completion of the post-closure monitoring activities.

Task Manager - Dave Aschom (Sweet Edwards/Emcon)

Activities - *Inspect closure, closure-related data, prepare closure and post closure certification*

Team Members - *L. West, D. Geller (HWA)*

- *Sweet-Edwards/Emcon, L. Dawson*

Schedule - *Closure certification: 130 days (8/11/90)*

- *Post-closure certification 5 (1-5d) days*

TASK 17 - PROJECT REPORTING/DOCUMENTATION

This task is divided into 7 subtasks including:

Subtask 17.1 - Prepare Critical Data Gap Analysis Summary
Subtask 17.2 - Prepare Draft and Final Project Plans
Subtask 17.3 - Prepare Well Construction/Completion Record Report
Subtask 17.4 - Prepare Closure Certification/Report
Subtask 17.5 - Prepare Post-Closure Monitoring Report
Subtask 17.6 - Prepare Raw Data Submittal
Subtask 17.7 - Prepare Final Project Report

Subtask 17.1 - Prepare Critical Data Gap Analysis Summary: After completing a review of existing information provided by the Government, concurrently with preparation of the draft project plan, and within 20 days after contract award, the Hong West Team shall prepare and submit a brief summary of findings, recommendations, and justifications concerning data gaps, ranking them from greatest to least importance. The CO will evaluate the summary and advise the Hong West Team on which recommendations, if any, should be incorporated into the project plan. Three (3) copies of this summary shall be sent to the COR and one (1) to the CO.

Subtask 17.2 - Prepare Draft and Final Project Plans: Three (3) copies of the draft plan shall be sent to the COR and one (1) to the CO within 25 days after contract award. Five (5) copies of the final plan shall be sent to the COR and one (1) to the CO within 45 days after contract award. The site safety and sampling and analysis plans shall be appendices to the project plan.

Subtask 17.3 - Prepare Well Construction/Completion records Report: Drilling logs, geological analyses, as-constructed drawings, development protocols, and related documentation of the construction/completion/development of each monitoring well/piezometer and a detailed site map shall be completed in five (5) copies, one to be sent to the CO and four (4) to the COR within 130 days after contract award.

Subtask 17.4 - Prepare Closure Certification/Report: Within 180 days after contract award, a closure certification shall be prepared and submitted. One (1) copy shall be sent to the CO and six (6) sent to the COR.

Within 180 days after contract award, a comprehensive closure report describing the closure, analyti-

cal results, observations, and findings shall be prepared and submitted. The report shall include all appropriate documentation, such as chain of custody sheets, drilling logs, a detailed site map, copies of hazardous waste manifests, and QA/QC data. Five (5) copies of the report shall be sent to the COR and one (1) to the CO.

Subtask 17.5 - Prepare Post-Closure Monitoring Reports: Within 50 days after each post-closure monitoring event, the Hong West Team shall prepare and submit a stand-alone report to include sampling procedures, observations, analytical results, QA/QC data, and an interpretation/analysis covering all monitoring results to that point (i.e., each report will update and extend the previous one). Five (5) copies of each report shall be sent to the COR and one (1) to the CO.

Subtask 17.6 - Prepare Raw Data Submittal: Upon the completion of all data acquisition and prior to submission of the final project report, the Hong West Team will compile all project related raw data in a systematic format with table of contents and submit two (2) copies to the COR and one (1) copy to the CO.

Subtask 17.7 - Prepare Final Project Report: Within 60 days after the post-closure certification or the last round of post-closure monitoring, whichever is shorter, the Hong West Team shall prepare and submit a stand-alone final project report that documents all work performed on the site, presents analytical results, and provides discussion and recommendations. Five (5) copies of this report shall be sent to the COR and one (1) to the CO.

Task Manager - Larry West, Project Director

Activities - Data gathering and reduction, data analysis and interpretation, meetings/ conferences with Team members; preparation of reports

Team Members - It is expected that nearly all the members of the Hong West Team shall directly or indirectly contribute to report completion

Schedule - Refer to Appendix A

TASK 18 - PROJECT MANAGEMENT

Active project management will be critical to successfully completing this project on schedule and within budget. Therefore, the Hong West Team has assigned a professional manager as well with a hydrogeologic background to the project as Project Director. *As such, Larry West will be Task Manager for Task 18.*

Organization and coordination are key factors in successfully completing a fast track, complex project like the YARL septic tank system "clean closure".

PROJECT COORDINATION

The Hong West Team adheres to the triangular concept of project coordination. At no time will more than three people be involved in the coordination of any project activity. Typically, for either internal

or external project coordination, two of the three will include the project director and the CO or COR.

External Project Coordination: *If the CO or COR notifies the Hong West Team that EPA, WDOE, or their designees wish to monitor or observe specific portions of project performance, the Hong West Team shall notify the CO a minimum of 48 hours in advance of the time these operations are planned to commence. The CO or COR will notify the agency or its designee as soon as possible thereafter. The Hong West Team shall not commence the activity to be monitored until the required observers are present.*

The Hong West Team shall release, provide, or discuss no information concerning this project without the written consent of the CO or COR.

With the exception of basic data collection, the Hong West Team will not contact/communicate with outside agencies unless specifically directed by the CO/COR and then, only through the project director.

Internal Project Coordination: Each task will be assigned a task manager answerable directly to the project manager and responsible for coordination and completion of a given task and any reports associated with that task. Any activities impacting ARS operations will be coordinated between the task manager, the project director and the COR/CO.

PROJECT BUDGET CONTROL

After project coordination and successfully achieving the project's goals, project budget control is the project manager's most important function. A realistic budget, tight operational controls and fast, reliable project accounting systems are the keys to successful project budget control. Hong West & Associates uses Timberline accounting software package specifically designed for project oriented geotechnical firms. Our system allows bimonthly and weekly updates of project status (hours worked, costs, subcontractors invoices etc.). This provides for real time data such that the project manager knows at all times the status of the project budget and what work has been accomplished. This allows for early correction of over-budget trends to ensure that the project will be completed within or under budget when the final report is delivered.

PROJECT COMPLETION CHECKLIST

Each task manager will be responsible for developing a detailed checklist of all products and actions involved in a specific task. An outline of this check list (major tasks elements) will be included in the project plan. As each product or action is completed the task manager will notify the project director and the work item checked off the master list. Major elements will be noted in the progress reports and the CO will always know exactly what work has been completed and what work remains. This system has proven very effective in the past and ensures that all project personell know exactly what they have to do and provides the project director, along with the budget updates, a complete picture of the project's status.

PROGRESS REPORTING/DOCUMENTATION

Progress Reports: Prior to completion of the closure certification, the Hong West Team shall prepare and submit to the CO and COR monthly progress reports. After closure certification until project completion, the Hong West Team shall prepare and submit quarterly progress reports. These reports shall summarize progress on the project by updating activities, accomplishments, problems, expenditures, and final cost projections and project completion. They shall also preview upcoming activities.

The Hong West Team's progress reports will also include a cumulative graph illustrating project budget versus project expenditures.

Daily Log: During fieldwork phases of this project, a daily log of onsite activities shall be maintained by the site supervisor. At a minimum, the log shall list and briefly describe any activities, events, procedures, accidents and releases, number and types of samples collected, inspections, equipment and personnel on site, visitors, problems encountered, and other relevant observations. A master map shall be established to aid in documenting the location and type(s) of samples taken, wells drilled, incidents and so forth. Information, such as depth, characteristics, and sample number(s), shall be re-

Telephone Log: A telephone log summarizing conversations related to this project shall be maintained. Information to be included in the log shall include the date and time of the call, names and affiliations of people participating, telephone number(s), purpose of the call, and a summary of the conversation.

Upon project initiation a project packet including project specific forms, organization chart, schedule etc. will be distributed to all project team members.

MEETINGS

The Hong West Team shall prepare for and participate in meetings as may be necessary during the course of the contract. A total of four (4) meetings should be assumed. The Hong West Team shall prepare and promptly submit to the CO and COR minutes of meetings in which we participate. The minutes shall include the location and time of meeting, date, attendees and affiliations, agenda, and detailed summary of the discussion and outcome.

The Hong West Team's budget provides for one meeting in Yakima and three in Seattle.

GENERAL

Plan Variation: Variations from these specifications proposed by the Hong West Team will be evaluated by the CO and adopted if they are demonstrated by the Hong West Team to be equivalent, cost-beneficial, technically superior, and consistent with regulatory requirements and policies. No variations from these specifications shall be implemented by the Hong West Team without prior written authorization from the CO.

Government-Furnished Property: The Government will furnish space to accommodate a single trailer on the worksite. Utility hookups for electricity and cold water will be provided at no cost to the contractor. Wastewater treatment/disposal and all other project-support requirements shall be the responsibility of the Hong West Team.

(c) PROJECT SCHEDULE

We recognize that the USDA's project schedule is governed by EPA/WDOE requirements and that successful completion of this project includes meeting the project schedule and ideally completing the project 30-60 days ahead of schedule. The attached Hong West Team's proposed schedule is based on the specified 540 day schedule, however we are confident that through close cooperation with USDA, rapid review of the project plan and the approach we have presented above, the Hong West Team will be able to complete most tasks and objectives in less than the scheduled time.

At present, we forsee no potential delays other than the disposition and disposal of waste pending classification. However, since we are storing all waste in drums, we do not see where any delays in classification and disposal will impact the overall project schedule and goals.

The Hong West Team's project schedule has built in contingencies to ensure that any unknown potential for delay is mitigated. Note, on our project schedule that tasks 1 through 6 begin immediatly upon award, particularly Task 4 - Assess Uppermost Aquifer and Task 6 - Risk Assessment. Initiating these tasks early-on will assist in identifying as soon as possible any potential unknowns which might affect the project schedule. Our critical data gap analysis as well as any refinement of the draft or final project plans will continue through the USDA's review. Significant findings which might impact schedule or goals would immediately be faxed to the agency for their consideration.

Additionally, we feel that our previous experience on-site and previous experience working with USDA will contribute greatly to meeting the tight schedule constraints imposed on USDA.

Project management is in the hands of the project director, who as a company principle, a professional manager and an experienced groundwater geologist has the skills and authority to ensure that the appropriate resources are available to complete the project within schedule and budget. Because the USDA and its Contracting Officer is in Maryland we have assigned a Deputy Project Director, who is also located in Maryland and was project manager on the previous YARL investigation. We feel this management approach will facilitate project communication between USDA and the Hong West Team.

SECTION III

APPENDICES

APPENDIX A

SITE HEALTH AND SAFETY PLAN

YAKIMA AGRICULTURAL RESEARCH LABORATORY

(U.S.D.A.): HEALTH AND SAFETY PLAN

Draft

Revised April 1990

Project No. 90042

Prepared By

Hong West and Associates
Lynnwood, Washington

and

Sweet-Edwards/EMCON
Kelso, Washington

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Appendices

1.0 INTRODUCTION

This Health and Safety Plan has been prepared to address the hazards that the field investigation and site closure team may encounter. The Plan includes a site description, hazard evaluation, monitoring requirements, work limitations, authorized personnel responsibilities, decontamination requirements and emergency requirements. The attached Site Safety and Operations Plan, summarizes the contents of this Plan.

Safety standards for Construction Work (Chapter 296-155 WAC) and General Occupational Health Standards (Chapter 296-62 WAC) will be observed. The Yakima Agricultural Research Laboratory (YARL) is part of USDA's Agricultural Research Service. From 1961 until 1985, pesticides were washed into a modified septic tank and drainfield system which was originally designed as a sanitary sewage system for YARL workers. Connections were added to modify the system for pesticide disposal, including a sink which was part of a pesticide storage building and an outdoor surface drain. Pesticides entered the septic system as part of dilute rinsates from field equipment or as more concentrated excess spray mixtures. It is estimated that as much as 100 pounds of pesticides (assume active ingredient equivalent) were injected into the septic tank drainfield each year. The disposal system is presently not in use.

The YARL facility is located in an area with complex and potentially vulnerable hydrogeology. The general ground water region is known as the Columbia Lava Plateau (Figure 1). This ground water region is characterized by lava flows of different ages which have given rise to multiple and highly transmissive aquifers. Above these basalt formations, at the YARL site, lie alluvial sediments consisting of sand, gravel, silt and clay. Stream deposits in the upper 20-30 feet are the uppermost source of ground water. The soil is a good agricultural loam (loam, silt loam, loess) with low to moderate permeability. However, soil permeability is not as important in determining potential ground water vulnerability for this site as it would be for a normal pesticide use site. This is because pesticides are typically applied at or just below ground surface. At YARL, the gravel-packed drain field was located at least two feet below ground surface. Thus, considering the depth to groundwater, the artificial recharge associated with loading from the septic system and expected moderate unsaturated permeability of the vadose zone - the potential for ground water vulnerability at this site is moderate to high. In addition, many of the pesticides used at YARL were mobile and/or persistent (but generally not highly soluble).

The septic tank drainfield was located to the immediate east of a wood frame structure (Figure 2). A portion of the drainfield may underlie a former storage area.

2.0 HAZARD EVALUATION

Performing field activities at the YARL facility poses several health and safety concerns. The hazards to project personnel include chemical exposure, safety hazards and potential thermal stress. These hazards are a function of the nature of the site as well as a consequence of the work being performed.

The primary area for chemical exposure comes from activities associated with the septic tank closure. The wide range of pesticides disposed of and which remain in the tank are expected to be a chemical hazard because of the possibility of inhalation exposure. Therefore, during tank contents removal and actual tank removal and subsequent tank pit sampling operations, inhalation exposure will be assumed and appropriate levels of safety implemented.

U.S.G.S. YAKIMA WEST QUADRANGLE

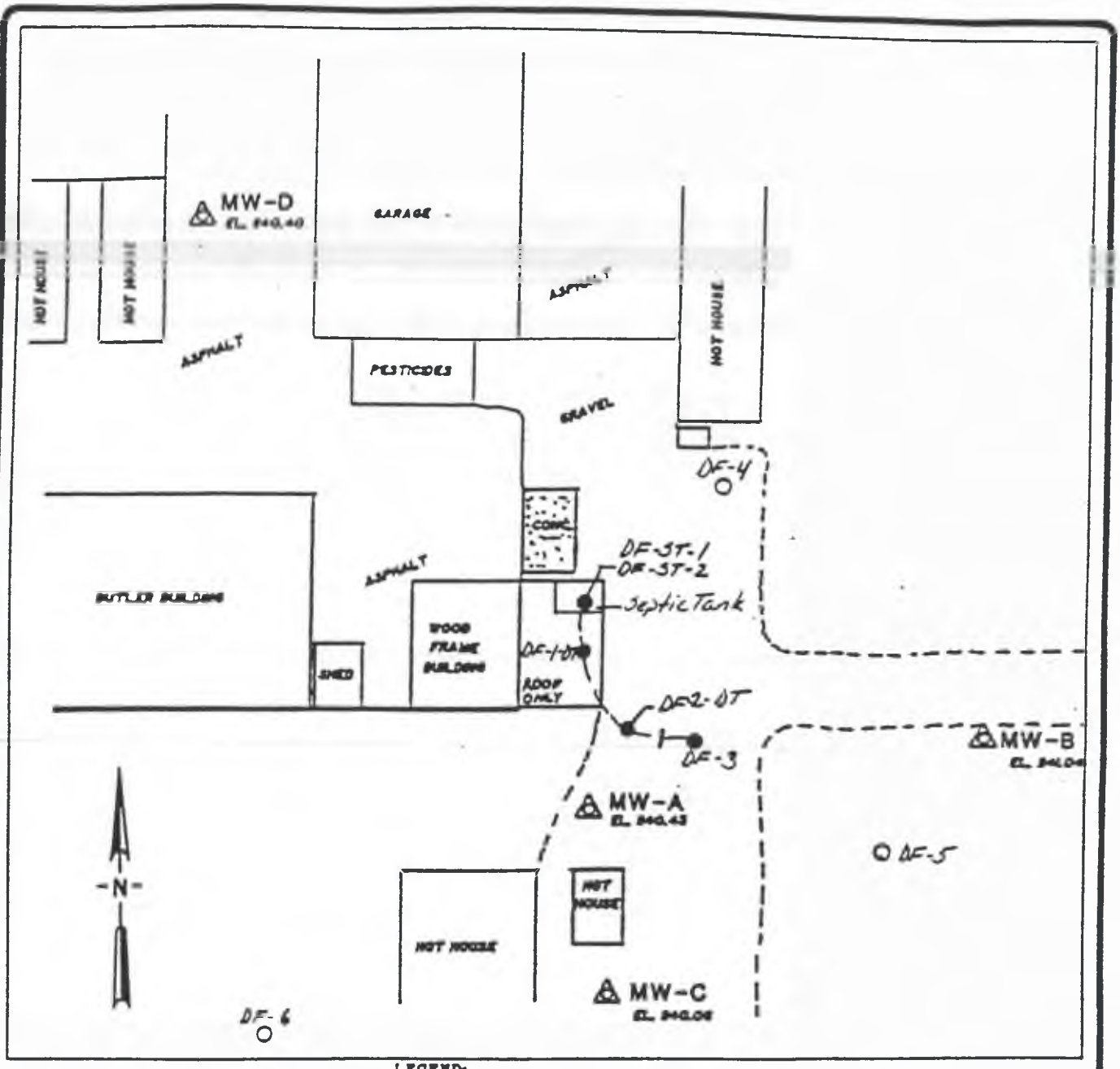
SCALE 1:25,000

SITE LOCATION PLAN

YAKIMA AGRICULTURAL RESEARCH LABORATORY

FIGURE 1

SOIL/SLUDGE SAMPLING LOCATIONS



LEGEND:

= Drainfield Alignment

= Drainfield Soil Sampling Location

= Background Soil Sampling Location

DT/ST = Drain Tile and Septic Tank Sludge Sampling Locations

0 30 60

Scale in Feet
Approx.

MW COORDINATES

WELL	NORTHING	EASTING
A	936.1	1055.6
B	950.3	1132.5
C	901.3	1060.3
D	1052.9	978.1

Basis of coordinates is the N.E. corner of the Butler building being north 1000 and east 1000.

REVIEW DRAFT

The secondary area for chemical exposure comes from soil, sediment and water sampling associated with ongoing site investigation activities. Table 2-1 presents potential pesticides and other potential contaminants which are included in the Sampling and Analysis program. Appendix A presents the detailed Site Safety and Operations Plan.

Safety hazards include working around heavy equipment (backhoe), sampling tank contents, removing (pumping) tank contents, rinsing the tank and sampling from an open pit or trench. It is expected that sampling from the tank pit excavation will be performed from ground surface, with planks placed over the pit and sample extraction completed with a hand auger. It is not recommended that personnel enter the tank excavation pit for sampling purposes. If the pit is to be entered, proper shoring measures should be implemented, and the pit excavation should be considered a confined space and appropriate levels of protection implemented.

As the Project Schedule indicates closure/site investigation activities will take place during the summer months, thermal exposure may at times be a hazard.

3.0 MONITORING REQUIREMENTS

The quality of the ambient air in the vicinity of all excavations (i.e. auger borings and tank excavations) will be monitored to assume the proper level of protection. Either a Photovac Tip II Photoionization Detector or an Organic Vapor Analyzer (OVA) will be deployed during closure and site investigation activities that involve disturbance of subsurface soils.

Air quality measurements will be taken frequently when excavating and sampling. Wind direction will be monitored with a windsock. Air space around the open excavations will be monitored and the Site Safety Officer will determine if additional monitoring is necessary or a higher level of personal safety is required. The decision for additional monitoring will be based on field conditions such as change in vapors from the excavation, the effectiveness of tank excavation ventilation (i.e. use of fans), break through in cartridge respirators, complaints of initial acute exposure symptoms from field personnel or any other indications of a potential hazard.

4.0 LEVEL OF PROTECTION

The selection of personal protection equipment is an integral part of the Hong West Team's Health and Safety Program. The level of protection must be adequate to protect individuals from hazards encountered while working at the YARL facility. Over-protection can also prove to be hazardous due to heat stress, physical and psychological stress, impair vision, reduced mobility and agility and poor communications.

Selection of the level of protection will be based on guidelines summarized in Table 4-1. The level of protection will be dependent upon the location and type of activity being conducted.

The selection of respiratory protection will be based on air monitoring in the field. The decision will be made by the HWA Site Safety Supervisor (with possible consultation with the Project Safety Officer) as to which level is appropriate. Protective clothing (polycoats with latex inner gloves) will be worn at all times. The use of Air Purifying Respirators (APR) will be based on the presence of total organic compounds venting from excavations (and from the septic tank during removal), complaints of initial acute exposure symptoms from field personnel, or any other indications of potential hazards. SCBAs will be worn during tank cleaning and tank removal, as a precaution. During field investigation activites, the cartridges used will be Organic Vapor/Dust, Fume, Mist. Further information on respiratory protection is given in Appendix A.

Table 2-1

Soil and Ground Water Testing Parameters

a) 40 CFR 265.92(b) (1) Parameters (EPA Interim Drinking Water Standards):

Arsenic
Barium
Cadmium
Chromium
Fluoride
Lead
Mercury
Nitrate (as N)
Selenium
Silver
Endrin
Lindane
Methoxychlor
Toxaphene
2, 4-D
2, 4, 5-TP Silvex
Radium
Gross Alpha
Gross Beta
Turbidity
Coliform Bacteria

b) 40 CFR 265.92(b) (2) Parameters:

Chloride
Iron
Manganese
Phenols
Sodium
Sulfate

c) 40 CFR 265.92(b) (3) Parameters:

pH
Specific Conductance
Total Organic Carbon (TOC)
Total Organic Halogen (TOX)

Table 2-1 (cont)

Soil and Ground Water Testing Parameters
d)
DDT
DDE
DDD
Lindane
Azinphosmethyl (Guthion)
Parathion
Paraoxon
Organophosphates
Chlorinated Hydrocarbon Scan
Diazinon
Chlorpyrifos
Endosulfan I and II (Thiodan)
Kelthane
Malathion
TEPP
Temik
Captan
Carbaryl (Sevin)
Cyprex
Benlate
Toluene
Xylene
Benzene
Pyrene

Table 4-1

Guidelines for Selecting the Level of Protection

LEVEL OF PROTECTION	EQUIPMENT RECOMMENDED:	SHOULD BE USED WHEN:	LIMITING CRITERIA
B SCBA.	Pressure-demand, full-facepiece SCBA or pressure-demand supplied-air respirator with escape respiratory protection.	The type and atmospheric concentration of substance have been identified and require a high level of respiratory protection	Use only when the vapor of gases present are not suspected of containing high concentrations of chemicals that are harmful to skin or capable of being absorbed through the intact skin.
	Chemical-resistant clothing.	This involves atmospheres: - with IDLH concentrations of specific substances do not represent a severe skin hazard; OR	
	Inner and outer chemical-resistant gloves.	- that do not meet the criteria for use of air-purifying respirators.	Use only when it is highly unlikely that the work being done will generate either concentrations of vapors, gases, or particulates or splashes of material that will affect exposed skin
	Chemical-resistant safety boots/shoes.	Atmosphere contains less than 19.5 percent oxygen.	
	Hard hat.	Presence of incompletely identified vapors or gases is indicated by direct-reading organic vapor detection instrument, but vapors and gases are not suspected of containing high levels of chemicals harmful to the skin or capable of being absorbed through the intact skin.	
	Coveralls, poly coat Tyvek		

Table 4-1 (cont.)

Guidelines for Selecting the Level of Protection

LEVEL OF PROTECTION	EQUIPMENT RECOMMENDED:	SHOULD BE USED WHEN:	LIMITING CRITERIA
C half-mask	Full-facepiece, air-purifying, canister-equipped respirator. Chemical-resistant clothing. Inner and outer chemical-resistant gloves.	The atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect any exposed skin. The types of air contaminants have been identified, concentrations measured, and a canister is available that can remove the contaminant.	Atmospheric concentration of chemicals must not exceed IDLH levels. The atmosphere must contain at least 19.5 percent oxygen.
	Chemical-resistant safety boots/shoes. Hard hat OPTIONAL: Coveralls, Tyvek Escape mask.	All criteria for the use of air-purifying respirators are met.	
D	Coveralls. Safety boots/shoes. Safety glasses or chemical splash goggles. Hard hat. OPTIONAL: Gloves Escape mask Face shield.	The atmosphere contains no known hazard. Work functions preclude splashes, immersion, or the potential for unexpected inhalation of or contact with hazardous levels of any chemicals	This level should not be worn in the Exclusion Zone. The atmosphere must contain at least 19.5 percent oxygen.

FROM: NIOSH/ISHA/USCG/EPA - Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities.

5.0 WORK LIMITATIONS

Heat stress and heat stroke are potential problems at the YARL site, and are usually caused by wearing protective clothing for extended periods. The field work routine for personnel wearing protective clothing and equipment restricting normal air circulation must be regulated. Otherwise, heat stress may become more of a threat than a potential hazard itself.

To reduce the possibilities of heat stress or heat stroke, personnel wearing protective clothing will have a mandatory 10 minute break each hour when air temperatures exceed 75 degrees F. At air temperatures below 75 degrees F, the frequency and duration of rest periods will be decided by the Hong West Team's Site Safety Supervisor.

6.0 AUTHORIZED PERSONNEL RESPONSIBILITIES AND TRAINING

The key Hong West Team personnel are Steve Greene, Site Safety Supervisor; Dale Berndt, Project Safety Officer; Larry West, Project Director; Doug Geller, Senior Hydrogeologist and personnel employed by ChemSafe Services (tank removal subcontractor). The Project Director is responsible for completion of the scope of work and Project Safety Officer is responsible for implementation of the Health and Safety Plan and the Site Safety Supervisor is responsible for completion of field activities and following the Health and Safety Plan. All personnel involved in field activities during closure and site investigation will at a minimum have receive 40 hours of OSHA training in personal safety at hazardous materials sites.

The Hong West Team's certified industrial hygienist (CIH), Dale Berndt, will act as the onsite Safety Officer during the initial tank closure phase of the project, in conjunction with Steve Greene. Air monitoring will be performed by both individuals during removal of the septic tank contents, cleaning and rinsing of the tank and removal of the tank. The CIH (Dale Berndt)will provide direction on the appropriate level of protection. Steve Greene will supervise subcontractor personnel to assure personal safety. It is expected that the CIH will only be required on-site during tank closure activities. At all other times, (i.e., during site investigation and monitoring) Steve Greene will be the Site Safety Supervisor. The CIH will then act as an off-site safety resource should an unforeseen safety or health concern develop.

Site-specific health and safety training will consist of a pre-site safety indoctrination and daily site safety updates. The pre-site safety indoctrination will cover a review of the approved Site Health and Safety Plan, as well as any pertinent new information available. Daily site safety updates will inform workers of new hazards or conditions as the need arises.

As mentioned above, all field personnel will be trained in accordance with OSHA Training requirements as set forth in 29 CFR 1910.120. For most work (except tank closure) Level C and Level D will be required. Level B is planned for tank closure.

7.0 EMERGENCY RESPONSE

The following is a contingency plan that outlines policies and procedures for responding to site emergency situations. When an emergency occurs, decisive action is required. This plan covers personnel, the site, equipment documentation and emergency procedures.

The Site Safety Supervisor (Steve Greene) will direct emergency response operation. If any operation threatens a worker's safety, work will be stopped.

In an emergency, the Site Safety Supervisor will identify an emergency and will be responsible for notifying the appropriate emergency response agency. The telephone numbers and addresses for the hospitals, poison control center and emergency transportation (fire, ambulance, police) have been summarized on page 4 of the Site Safety and Operations plans (attached).

Safety equipment will be stored on site. The equipment will include personal protection equipment, first aid kit, fire extinguisher, eye wash station, drinking water and decontamination materials. The Hong West Site Safety Supervisor will maintain and organize the equipment

Documentation and reporting of emergency situations will be the responsibility of the Site Safety Supervisor, in consultation with the Project Safety Officer. In the event of an incident, the Project Safety Officer will initiate an investigation and complete an incident report. Copies of the report will be sent to U.S.D.A. and to the Project Director. The report will include at a minimum chronological history of the incident, facts as they become available, title and names of personnel involved and history of injuries.

Appendix A

SITE SAFETY AND OPERATIONS PLAN

SITE SAFETY AND OPERATIONS PLAN

SITE: Yakima Agricultural Research Laboratory
DATE: April 19, 1990
LOCATION: 3706 Nob Hill Boulevard
Yakima, WA 98902
PREPARED BY: Dale Berndt

CLIENT CONTACT:

PROJECT OBJECTIVE(S): Hydrogeologic and soils investigation, which involves soil and ground water sampling. Sampling of contents, removal of septic tank, and subsequent soil sampling in vicinity of septic tank.

SCHEDULED ACTIVITIES/TIME PERIOD: Estimated to begin June 1, 1990

BACKGROUND REVIEW

	PRELIMINARY	COMPLETE
ACCESS, OVERHEAD/UNDERGROUND UTILITIES, ETC.		X
WASTE CHARACTERIZATION	X	
HAZARD/SAFETY LEVEL DETERMINATION:	X	

COMMENTS: Hazardous determination is based on site history. A wide range of pesticides and solvents can be expected: including, but not limited to, Guthion, Sevin, Malathion, Parathon, TEPP, Temile, Methoxychlor, Kelthane, Lindane, Capatane, Cyprex and Benylate.

WASTE TYPE(S)/CHARACTERISTICS

LIQUID	X	SOLID	X	SLUDGE	X	GAS	
CORROSIVE	X	IGNITABLE		REACTIVE		VOLATILE	
TOXIC	X	RADIOACTIVE		UNKNOWN	X	OTHER	

SPECIAL CONSIDERATIONS/COMMENTS: Miscellaneous pesticides, chlorinated hydrocarbons, organophosphates and carbonates are known to have been disposed of in the original septic tank system.

S-E/E 100-03a

FACILITY DESCRIPTION

SIZE: one block area BUILDINGS/STRUCTURES: greenhouses and laboratories

TOPOGRAPHY/ACCESS: Access from Nob Hill Boulevard. Topography generally flat across the site.

GENERAL GEOLOGIC/HYDROLOGIC SETTING: Located north of White Hollow Creek underlain by alluvial sands and gravels. Ground water is encountered at 35-feet below surface.

STORAGE/DISPOSAL METHOD(S): Agricultural Research facility -- all disposable materials contained.

STATUS (active; closed; unknown) : Active

HISTORY (injury; illness; complaints, public or agency) : No reported injuries or illnesses.

SPECIAL CONDITIONS/COMMENTS:

HAZARD EVALUATION

Chemical: Inhalation and dermal contact of volatile organics, semi-volatile and pesticide compounds during sediment, water sampling and removal of septic tank and concrete wash pad.

Thermal: Outside exposure during summer months when in protective clothing may create heat stress.

Air Quality: Organic vapors and/or dust contaminated with pesticides may be present. Use 1/2 to full face mask with organic vapor cartridges and dust filters upon CIH recommendations.

Physical: Hazards from heavy equipment operations (backhoes, trucks, drill equip.) Typical slipping, tripping, falling hazards.

OPERATIONS PLAN

MAP/SITE SKETCH ATTACHED AS EXHIBIT X .

SITE CONTROL (for vehicles, workers, public, etc.) SHOWN ON EXHIBIT X

ZONES OF CONTAMINATION: [ ] Known [X] Projected [ ] Unknown

EXCAVATION, DRILLING OR SAMPLING METHOD: Backhoe excavation of septic tank. Sampling and transfer of contents.

COMMENTS: Contamination most likely present in soils beneath and around septic tank, if present.

SAFETY EQUIPMENT AND PROCEDURES

LEVEL OF PROTECTION: [ ] A [ ] B [X] C [X] D

ADDITIONS/MODIFICATIONS: Upgrade to C protection if dust or TIP readings exceed greater than 5% of background readings.

SPECIAL SURVEILLANCE EQUIPMENT AND MATERIALS: Photoionization Detector (TIP II) (10.6 ev lamp) used to detect volatile organics and pesticides.

DECONTAMINATION PROCEDURES: All personnel will scrub exposed skin areas before leaving work area. A plastic bag will be used to dispose of all protective clothing and trash at each site. An on-site decontamination station to be set up on-site at location shown on site map.

P.D.S. STATION(S): The location may change depending on wind direction.

P.D.S. EQUIPMENT, MATERIALS AND SPECIAL FACILITIES: Soft and hard bristled brush, wash pans and detergent. Water is available at several locations near septic tank. Decon station to be determined based on wind conditions during task excavation.

SITE ENTRY PROCEDURES

SITE TEAM (No.): _X_ Sweet-Edwards _X_ Client ____ Agency _X_ Other

ENTRY BRIEFING DATE: First day of sampling LOCATION: at site

SITE WORK TEAM (name/responsibility) 1. Denise Mills (Hydrogeologist)

2. Dennis Goldman (Project Manager) 3. Chemsafe (Excavation)

4. Steve Green (HWA) 5. Dale Berndt (SE/E - CIH)

6. _____ 7. _____

SPECIAL CONDITIONS (e.g., work schedule or limitations): _____

EMERGENCY PROCEDURES

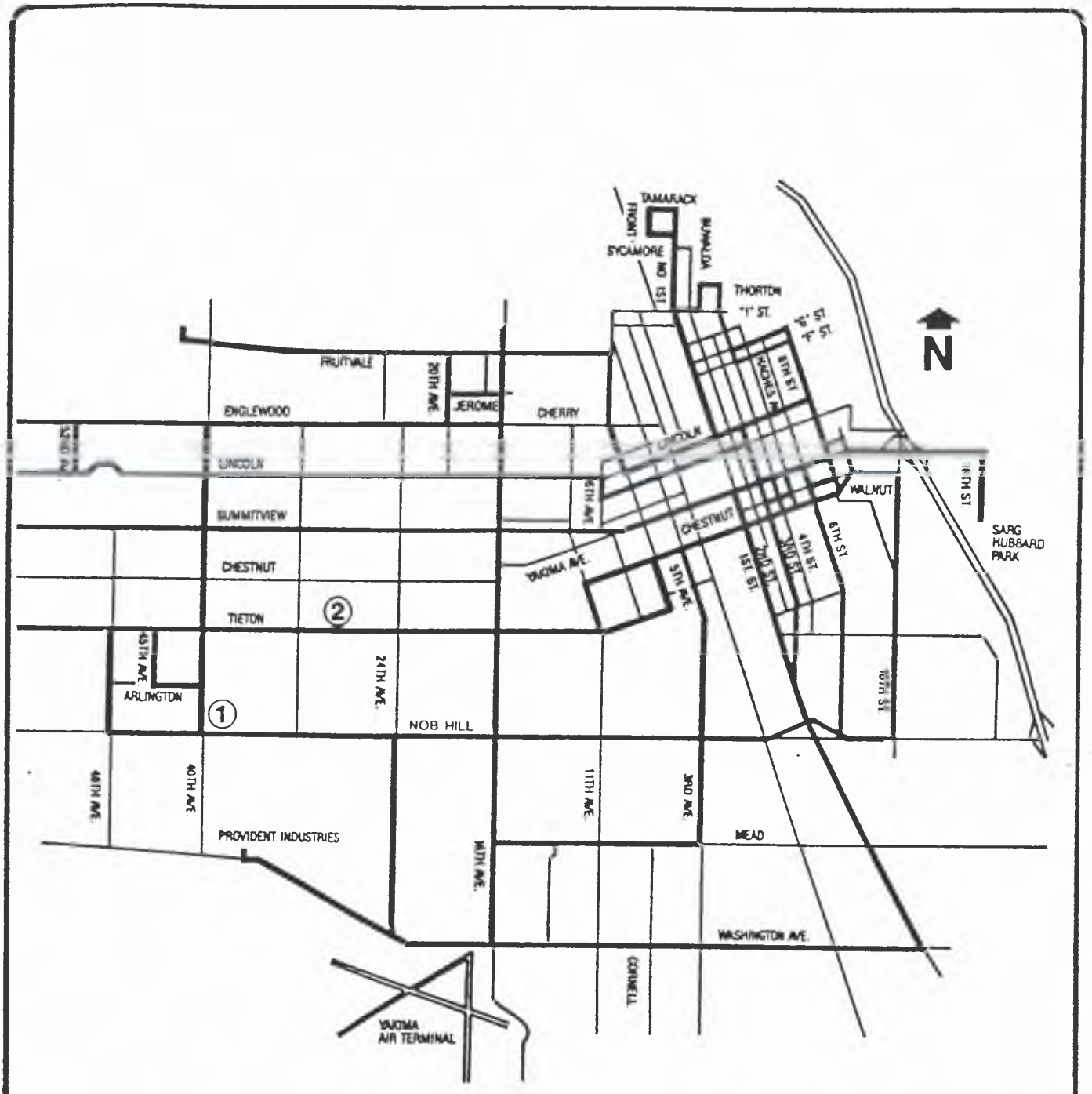
ACUTE EXPOSURE SYMPTOM(S):	FIRST AID
1. Irritation of eyes, nose, throat	Irrigation (immediate)
2. Skin irritation	Scrub, wash and rinse
3. Nausea	Fresh air, oxygen
4. Head ache, weakness	Fresh air, oxygen
5. Abdominal pain	Fresh air, oxygen
6.	

HOSPITALS/EMERGENCY MED. CENTER (Address/phone#) MAP ATTACHED: ☒ Y ☐ N

1. Yakima Valley Memorial Hospital, 2811 Teiton Drive, Yakima, WA
2. (EMERGENCY -- 575-8100)
3. (POISON CONTROL -- 248-4400)
4. _____

EMERGENCY TRANSPORTATION (fire, ambulance, police):

1. Dial 911 for assistance
2. _____
3. _____
4. _____



EXPLANATION

① Site Location (3706 Nob Hill Blvd.)

② Yakima Memorial Hospital (2811 Tieton Drive)

NOT TO SCALE

Sweet-Edwards EMCON

DATE 4-20-90
DWN. MMM
APPR.
REVIS.
PROJECT NO. W2501.01

YAKIMA AG. RESEARCH LAB

Emergency Route to Hospital

Appendix B

RESPIRATORY PROTECTION

APPENDIX B

RESPIRATORY PROTECTION

Hong West Team Policy for YARL Site

After consultation with qualified medical and industrial hygiene professionals, the Hong West Team's Project Safety Officer and Site Safety Supervisor select the types of respiratory equipment to be used by field personnel. A qualified individual will evaluate the potential respiratory exposure and determine proper protective equipment before entry into a potentially hazardous area is allowed. When required, half face-piece respirators may be used for routine operations, provided workers are fitted and trained with these respirators and obtain them from the safety officer. These half face-piece respirators will be equipped with cartridges and/or filters needed for specific operations.

Respirator fitting will be accomplished through the implementation of the irritant smoke fit test. This test will be conducted by the Site Safety Supervisor in accordance with state and federal regulations. The Safety Supervisor will demonstrate how to put on a respirator, how it should be positioned on the face, how to set strap tension, and how to assess a comfortable respirator. After the fitting with the respirator on, the test subject will conduct negative and positive pressure checks, and the Safety Supervisor willl initiate the irritant smoke test. These tests will ensure the integrity of the face-to-face-piece seal. If a comfortable and leak-proof fit cannot be found, the subject will be asked to wear a full face-piece respirator to achieve the proper level of protection.

Guidelines

1. All field personnel must be fitted with and assigned a half face-piece respirator with site-specific protective cartridges or filters (Figure 2). Resealable, plastic storage containers and carrying bags will be made available to facilitate proper respirator care. When not in use, respirators must be stored to protect against dust, sunlight, extreme temperatures, rodents, excessive moisture and damaging chemicals.

2. Facial hair shall be styled in such a manner so that the individual's respirator will make a complete seal against the face.

3. Respirators should always be worn when effective engineering controls are not feasible and there are suspected concentrations of harmful dusts, fumes, mists, vapors or gases in the atmosphere - or where protection against occasional and/or relatively brief exposure is needed.

4. Respirators must never be used as protective devices where the level of dusts, fumes, mists, vapors or gases is immediately dangerous to life or health, nor in ambient atmospheres containing less than 19.5% oxygen by volume.

5. The respirator equipment should be inspected for worn or aging rubber parts and/or damaged components before and after each use and during cleaning. Worn or damaged parts must be replaced immediately.

6. Selection of charts are posted in the safety equipment storage area (on-site trailer) describing the cartridges and filters to be used by Hong West Team personnel for respiratory protection.

7. If any of the following signals are sensed while using the respirator, immediate evacuation to fresh air is compulsory (the cartridge or filter may be spent or abnormal conditions may be creating vapor concentrations which are beyond the limit of the respirator):

A. Smell or taste of chemicals

B. Irritation of the eyes, nose or throat

C. Difficulty in breathing

D. Temperature elevation of inspired air

E. Loss of equilibrium

F. Nausea or lightheaded sensation

8. Before and after entering an area of known exposure, cartridges should be discarded and replaced. If there is no known exposure, the maximum life of a cartridge is 15 working days -- as long as preventative maintenance techniques are observed.

9. The face-piece (with cartridges and filters removed) should be washed after each use with warm water and a mild detergent. Disinfecting will not be necessary if water is reused by the same person. Cleaning and disinfecting materials will be located at the safety equipment storage area.

10. In the event a supplied air breathing apparatus or full-face piece respirator becomes necessary, individual instructions detailing the need, use, and limitations of these systems will be provided by the Safety Supervisor, or Project Safety Officer.

11. Periodic training and retraining will be provided, as required, to ensure familiarity with all new and old equipment.

APPENDIX B

SAMPLING AND ANALYSIS PLAN

YAKIMA AGRICULTURAL RESEARCH LABORATORY (U.S.D.A.): CLEAN CLOSURE AND NATIONAL PRIORITY LIST DELISTING

SAMPLING AND ANALYSIS PLAN

DRAFT

April, 1990

Prepared By

Hong West & Associates
Lynnwood, Washington

Biospherics Incorporated
Beltsville, Maryland

Sweet-Edwards/EMCON
Bothell, Washington

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1.0 INTRODUCTION

1.1 BACKGROUND

From 1965 until approximately 1985, the USDA's Yakima Agricultural Research Laboratory (YARL) discharged dilute pesticide wastes into the septic system.

Following receipt of a RCRA violation notice and listing on the CERCLA National Priority List (NPL), USDA contracted a subsurface contaminant assessment investigation. That study is complete and has demonstrated that the surficial aquifer has not been significantly impacted by the septic system. However, the septic tank contents are hazardous and contain moderate to high concentrations of pesticides.

Thus the purpose of this project is to execute a clean closure plan in conformance with all relevant RCRA and State requirements. Closure and post-closure monitoring and assessments also support Superfund NPL delisting of the facility.

1.2 OVERALL SCOPE OF WORK

This sampling and analysis plan supports a multi-task project. All project tasks are listed below.

Tasks

1 - Critical Data Gap Analysis (complete)
2 - Prepare Project Plan (draft complete)
3 - Prepare Sampling and Analysis Plan (this document)
4 - Assess Uppermost Aquifer
5 - Develop Site Safety Plan
6 - Risk Assessment
7 - Remove and Dispose of Septic Tank Contents
8 - Excavate and Remove Septic Tank
9 - Assess Residual Contamination at Septic Tank Site
10 - Washdown Pad Inspection and Disposal
11 - Assess Residual Contamination Under Washdown Pad
12 - Drainfield Area Soil Sampling
13 - Install Monitoring Wells
14 - Well Maintenance/Post Closure Monitoring
15 - Site Restoration
16 - Closure/Post Closure Certification
17 - Project Reporting/Documentation
18 - Project Management

Sampling and analysis will take place during performance of Tasks 7, 8, 9, 10, 11, 12 and 14.

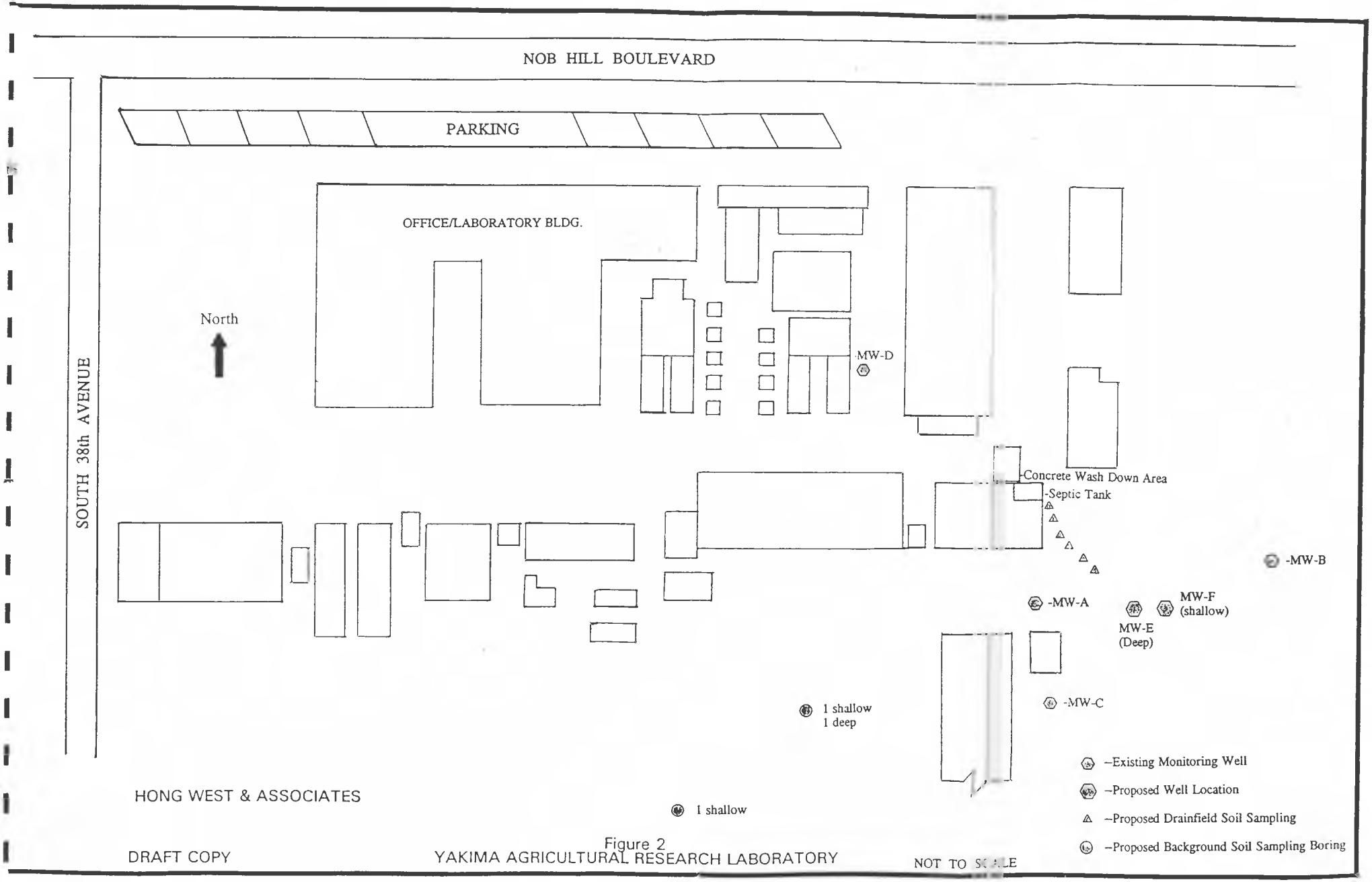


Figure 2
YAKIMA AGRICULTURAL RESEARCH LABORATORY

2.0 SAMPLING AND ANALYSIS PLAN

2.1 STUDY DESIGN

2.1.1 Identification of Analytes

All soil and septic tank samples will be analyzed for the standard list of volatile organic compounds (VOCs) specified in SW-846 by EPA Method 8240, base/neutral/acid extractables (BNAs; semi-volatiles) organochlorine insecticides plus PCBs, organophosphate insecticides, cyanide, and metals included in the Superfund Target Compound List (TCL; HSL). The ground water samples will be analyzed for a similar compound list, with two exceptions. The VOCs will include all VOCs on the TCL. The metals will be filtered, rather than total (dissolved + suspended fractions).

2.1.2 Sampling Locations, Numbers and Types of Samples

Following are the site locations to be sampled, the analyses, the matrices, and the number of samples.

2.1.2.1 Septic Tank Contents

This sampling activity will be part of Task 7.

If possible, all three anticipated phases of the septic tank contents will be sampled--floating solids/sediments, liquids, and sludge.

Test Description	Matrix	Quantity
EP Toxicity: Metals, Pesticides, Herbicides and Extraction	s/s/s	3
Reactivity	s/s/s	3
Corrosivity	s/s/s	3
Ignitability	s/s/s	3
Metals	Rinsate	1
Pesticides: 8080 8140 and 8150	Rinsate	1

2.1.2.2 Area Under Washdown Pad

This sampling activity will be part of Task 11.

The following will be collected: 4 soils; 1 trip blank; 1 field decontamination water; 1 wash water. All samples will be analyzed by SW 846 protocol and reported as TCL compounds. Verbal results including second column confirmations will be supplied in 2 weeks. Written report of results provided in 4 weeks

Test Description	Matrix	Quantity
VOAs	s/s/s	4
Semi-VOAs	s/s/s	4
Pest/PCBs	s/s/s	4
Organophos Pest	s/s/s	4
Metals	s/s/s	4

VOAs	Water	3
Semi-VOAs	Water	2
Pest/PCBs	Water	2
Organophos Pest	Water	2
Metals	Water	2

2.1.2.3 Assessment of Residual Contamination in the Septic Tank Pit

This sampling activity will be part of Task 9.

Soil samples will be collected from inside the septic tank pit to assess residual contamination after the septic tank has been removed. Specifically, eight soil samples will be collected as follows: one from each quadrant of the pit bottom and two each from 1-2 feet above the bottom at the ends and sides of the hole. In addition, three background soil samples will be collected from depth similar to the septic tank pit samples (Figure 1-1). Also, one trip blank, one wash water and one decontamination rinsate will be collected.

Task Description	Matrix	Quantity
VOCs	s/s/s	11
Semi-VOCs	s/s/s	11
Pest/PCBs	s/s/s	11
Metals	s/s/s	11
Cyanide	s/s/s	11
VOCs	water	3
Semi-VOCs	water	2
Pest/PCBs	water	2
Metals	water	2
Cyanide	water	2

2.1.2.4 Drainfield Area

This sampling activity will be part of Task 12.

This area was studied under the previous contaminant assessment contract, but more samples need to be collected.

The RFP requested a "statistical basis/methodology for types, numbers and locations of samples" (Section C.9). But it also specified the number of additional soil samples to be collected from the drainfield area (6). Thus, the task is to devise as statistically based grid network for six sampling points. A determination of grid spacing and statistical power was attained based on the guidance contained in the EPA Document Methods for Evaluating the Attainment of Cleanup Samples - Volume 1: Soils and Solid Media, (Chapter 9; February 1989). The following assumptions were used.

- Drainfield area is 2 ft. x 40 ft.
- All of the area under the drainfield is potentially contaminated, but the potential hot spots are circular, centered on tile drain section gaps, with 0.5 m diameters.
- Sampling pattern is triangular (n=6).

These calculations yield an 80-90 percent chance that if a hot spot of this nature exists, it will be detected with grid spacings (G)=1.1 m.

But 1.1 m grid spacings are inappropriate for a narrow area like the drainfield, and would yield more than six sampling points across a 12 m length. A conversation with an EPA/OPPE confirms that the sample grid spacing equation $n=A/G^2$ (A = area) is inappropriate for sites that are small and/or narrow such as the YARL drainfield. Therefore, we propose that the six samples be collected in an evenly widened space.

Samples will be collected from a depth of 6 feet to a depth of 9 feet or the top of the cemented caliche layer, whichever is encountered first, as requred in the RFP and site closure plan.

The following samples will be collected: 6 soil samples; 1 trip blank; 1 field contamination and 1 wash water. All samples will be analyzed by SW 846 protocol and reported as TCL compounds. Written report of results provided in 3 weeks.

Test Description	Matrix	Quantity
VOAs	s/s/s	6
Semi-VOAs	s/s/s	6
Pest/PCBs	s/s/s	6
Organophos Pest	s/s/s	6
Metals	s/s/s	6
VOAs	Water	3
Semi-VOAs	Water	2
Pest/PCBs	Water	2
Organophos Pest	Water	2
Metals	Water	2

2.1.2.5 Well Monitoring

This sampling activity will be part of Tasks 13-14.

Locations of the four existing wells and the two (?) proposed wells can be found in Figure 1-1.

One year (5 rounds) of quarterly post-closure monitoring will be initiated as soon after septic-tank closure as possible (July 1990). The sampling and analysis shall be in accordance with the approved sampling and analysis plan.

Sixty-one samples will be collected from the seven wells on five trips. Trip 1: (7 wells x 4 samples/well) + 1 trip blank = 29 samples. Trips 2-5: (7 wells x 1 sample/well x 4 trips) + 4 trip blanks = 32 samples. All samples will be analyzed by SW 846 protocol and reported as TCL compounds. Written report of results provided in 4 weeks.

Groundwater samples will be collected starting with wells in areas of low pesticide activity and low ground water contamination potential and proceeding to areas with greater pesticide activity and increased ground water contamination potential. Thus the following sampling order will be followed; MW-D, MW-B, MW-E, MW-F, MW-A, and MW-C (Figure 1-1). (Note: MW-C is the well that has occasionally shown low concentrations of VOCs).

Test Description	Matrix	Quantity
VOAs	Water	61
Herbicides	Water	56
Pesticides	Water	56
Organophos Pest	Water	56
Lead, Arsenic Cadmium and Mercury	Water	56

In addition, water levels and well depths will be measured monthly.

2.2 GROUND WATER SAMPLING

2.2.1 Installation of Dedicated Pumps

Dedicated "Well Wizard" pumps (Model T-1200) will be placed in each on-site monitoring well. Each ump will consist of a stainless steel body fitted with a Teflon bladder and stainless steel slot 0.010 screen. Pump Model T-1200 is 41.14 inches in length and 1.5 inches in width. Both the "air" supply lines and water (discharge) line will consist of Teflon-lined polyethylene. The air supply line will be 0.25 inch O.D. and the discharge line 0.50 inch O.D.

Each pump will be connected to a well cap assembly (Model 2120A). The assembly will be constructed of a PVC body with brass and polypropylene fittings, and compatible with a 2-inch PVC well casing. An access port in the well cap assembly allows depth to water measurements to be taken with a portable water level indicator.

The Well Wizard system will be driven with a automatic controller (Model 3013) equipped with adjustable purge and sample rates. Bottles of nitrogen gas will be leased to drive the controller/pump.

Each pump and tubing assembly come decontaminated and sealed in a plastic container from the factory. These seals will be broken on-site prior to installing the assembly in each monitoring well. Prior to installation, the unit will be rinsed externally with distilled water. The pump and tubing will be lowered into the hole carefully by hand and will have minimal contact with the PVC well casing. Non-contaminating gloves shall be worn at all times by field personnel installing the dedicated pump in each well.

Each pump will be set approximately 2 feet from the bottom of the well screen. Each of the two new Well Wizard pump systems were assembled to HWA specification at the QED Environmental Systems, Inc. facility in Ann Arbor, Michigan. No tubing should require modification to its length.

2.2.2 Quarterly Sampling

Five quarterly rounds of ground water samples will be collected from all six monitoring wells beginning in June 1990 (?). Sampling will continue one year.

2.2.2.1 Water Level Measurements

Depth to water measurements will be obtained with a Sinco probe or similar instrument. Access to each well casing will be through the access port on each well casing assembly cap. Water levels will be measured to the nearest 0.01 foot. Well probes will be calibrated prior to arriving on-site using a steel measuring tape. The water level probe will be disinfected with a 1:1 methanol solution and triple

rinsed with distilled water prior to use in each well. All measurements will be taken from a marked surveyed point on the top of the well cap assembly. Each measurement record will include the date, time and initials of the operator and recorded on a Well Data Sheet.

2.2.2.2 Well Purging

Following measurement of water levels in each monitoring well, at least five well casing volumes will be continuously removed, if possible, before any sample is collected for laboratory analysis. Should the monitoring well "purge dry", the purge process will be terminated and the volume of water removed recorded.

Each well shall be purged using the dedicated Well Wizard pumps. All purge water will be placed in 55-gallon drums and properly labeled as to contents, well and date. The drums will be stored on-site for subsequent evaporation. Conductivity, temperature and pH will be taken after the removal of each well casing volume. Samples will not be collected until these parameters have stabilized to +10 percent, unless the well purges "dry". Well purging data will be recorded on the Field Sampling Data Sheets.

2.2.2.3 Sample Collection

Hong West & Associates (HWA) will collect the type of samples that the United States Protection Agency (Region X) and USDA have agreed upon. All samples will be obtained using the QED dedicated pump. Field parameters (pH, specific conductance and temperature) will be obtained prior to filling sample bottles and after sampling is complete.

Samples for volatile organic compounds will have no head space to minimize the possibility of volatilization of the organics. Samples will be poured down the sides of the organic sample bottle and not splashed into its base. Ground water samples collected for laboratory analyses of organic parameters and total metals will not be field or laboratory filtered.

Should the well purge dry or produce water at very low rates, collect samples for the various parameters in the following order of decreasing priority.

1. BTX, VOAs - Recommended for initial collection by the EPA Technical Enforcement Guidance Document (TEGD) due to aeration concerns.
2. TOX and TOC parameters - A complete database is needed for the statistical analysis. Recommended for early sample collection in the TEGD.
3. Pesticides - These compounds are the major focus of our concern in this project.
4. Total Metals

Following purging of a low rate monitoring well, allow the well to recover within 95% of the previous volume and collect the samples. However, if approximately 2 hours have passed and the well has not sufficiently recovered, begin collecting samples anyway and continue collecting in the order given above until the well is nearly dry.

2.2.2.4 Sample Containers

Samples will be transferred in the field from the sampling equipment to a container specifically prepared for given parameters. The type of container used for each parameter, size and preservative will be recorded on the Field Monitoring Data sheet. Sample container types and preservatives for each parameter are given in Table 2-1. The number and type of bottles to be filled at each well for each sampling event are as follows:

- 2 - 40 ml VOA - BTX
- 1 - 250 ml amber glass - TOX
- 1 - 100 ml poly - TOC
- 2 - gal. amber glass - 622, 608, 615, 612, Method 5
- 1 - 1 L clear glass - Phenols
- 1 - 500 ml poly - Coliform
- 1 - 500 ml poly - Metals
- 1 - gal plastic - Radioactivity
- 1 - 1 L poly cube - Fl, Cl, NO3, SO4, Turbidity

Ground water samples will then be shipped to Biospherics Laboratory, Beltsville, Maryland, for chemical testing.

All sample containers will be prepared and provided by Biospherics Laboratory. Samples will be preserved as per recommendations given in Methods for Chemical Analysis of Water and Wastes, EPA-600, 4-79-020, March, 1979.

2.2.2.5 Field Blanks/Transfer Blanks

To ensure quality assurance and quality control, field and transport blanks will be obtained in each sampling event. These will enable cross-check and, in some cases, quantitative correction for imprecision that could arise due to sampling, handling, preservation, or laboratory procedures.

A field blank (method blank) will be taken for each separate sample bottle type. Distilled water will be poured into the appropriate sample bottles, and analyzed in the lab with the other samples. Field blanks will be tested at a rate agreed upon between USEPA and USDA.

Transport blanks will accompany each shipment of sample bottles to the Yakima facility and will return to the laboratory with the sample shipment for volatile organic analysis (Method 8240).

2.2.2.6 Sample Labeling

Sample container labels will be completed immediately prior to sample collection. Container labels will include the following information:

- Sample number
- Name of collector
- Data and time of collection
- Place of collection

TABLE 2-1

REQUIRED CONTAINERS, PRESERVATION TECHNIQUES, AND HOLDING TIMES

Name	Container[1]	Preservation	Maximum Holding Time
Bacterial Tests:			
Coliform, fecal and total	P, G	Cool, 4°C, 0.008% $Na_2S_2O_3$	6 hours
Fecal streptococci	P, G	Cool, 4°C, 0.008% $Na_2S_2O_3$	6 hours
Inorganic Tests:			
Acidity	P, G	Cool, 4°C	14 days
Alkalinity	P, G	Cool, 4°C	14 days
Ammonia	P, G	Cool, 4°C, H_2SO_4 to pH <2	28 days
Biochemical oxygen demand	P, G	Cool, 4°C	48 hours
Bromide	P, G	None required	28 days
Biochemical oxygen demand, carbonaceous	P, G	Cool, 4°C	48 hours
Chemical oxygen demand	P, G	Cool, 4°C, H_2SO_4 to pH <2	28 days
Chloride	P, G	None required	28 days
Chlorine, total residual	P, G	None required	Analyze immediately
Color	P, G	Cool, 4°C	48 hours
Cyanide, total and amenable to chlorination	P, G	Cool, 4°C, NaOH to pH >12, 0.6 g ascorbic acid	14 days
Fluoride	P	None required	28 days
Hardness	P, G	NHO_3 to pH <2, H_2SO_4 to pH <2	6 months
Hydrogen ion (pH)	P, G	None required	Analyze immediately
Kjeldahl and organic nitrogen	P, G	Cool, 4°C, H_2SO_4 to pH <2	28 days
Metals:			
Chromium VI	P, G	Cool, 4°C	24 hours
Mercury	P, G	HNO_3 to pH <2	28 days
Metals, except Chromium VI and mercury	P, G	HNO_3 to pH <2	6 months

[1]Polyethylene (P) or Glass (G)

TABLE 2-1 (continued)

REQUIRED CONTAINERS, PRESERVATION TECHNIQUES, AND HOLDING TIMES

Name	Container[1]	Preservation	Maximum Holding Time
Miscellaneous:			
Nitrate	P, G	Cool, 4°C	48 hours
Nitrate-nitrite	P, G	Cool, 4°C, H2SO4 to pH <2	28 days
Nitrite	P, G	Cool, 4°C	48 hours
Oil and Grease	G	Cool, 4°C, H2SO4 to pH <2	28 days
Organic Carbon	P, G	Cool, 4°C, HCl or H2SO4 to pH <2	28 days
Orthophosphate	P, G	Filter immediately, cool, 4°C	48 hours
Oxygen, Dissolved Probe	G Bottle and Top	None required	Analyze immediately
Winkler	G Bottle and Top	Fix on site and store in dark	8 hours
Phenols	G only	Cool, 4°C, H2SO4 to pH <2	28 days
Phosphorus (elemental)	G	Cool, 4°C	48 hours
Phosphorus, total	P, G	Cool, 4°C, H2SO4 to pH <2	28 days
Residue, total	P, G	Cool, 4°C	7 days
Residue, Filterable	P, G	Cool, 4°C	7 days
Residue, Nonfilterable (TSS)	P, G	Cool, 4°C	7 days
Residue, Settleable	P, G	Cool, 4°C	48 hours
Residue, Volatile	P, G	Cool, 4°C	7 days
Silica	P	Cool, 4°C	28 days
Specific Conductance	P, G	Cool, 4°C	28 days
Sulfate	P, G	Cool, 4°C	28 days
Sulfide	P, G	Cool, 4°C, add zinc acetate plus sodium hydroxide to pH >9	7 days
Sulfite	P, G	None required	Analyze immediately
Surfactants	P, G	Cool, 4°C	48 hours
Temperature	P, G	None required	Analyze immediately
Turbidity	P, G	Cool, 4°C	48 hours

[1]Polyethylene (P) or Glass (G)

TABLE 2-1 (continued)

REQUIRED CONTAINERS, PRESERVATION TECHNIQUES, AND HOLDING TIMES

Name	Container[1]	Preservation	Maximum Holding Time
Organic Tests:			
Purgeable Halocarbons	G, Teflon-lined	Cool, 4°C, 0.008% Na2S2O3, septum	14 days
Purgeable aromatic hydrocarbons	G, Teflon-	Cool, 4°C, 0.008% Na2S2O3, septum, HCl to pH 2	14 days
Acrolein and acrylonitrile	G, Teflon-lined	Cool, 4°C, 0.008% Na2S2O3, septum, adust pH to 4-5	14 days
Phenols	G, Teflon-lined cap	Cool, 4°C, 0.008% Na2S2O3	7 days until extraction, 40 days after
Extraction Benzidines	G, Teflon-lined cap	Cool, 4°C, 0.008% Na2S2O3	7 days until extraction
Phthalate esters	G, Teflon-lined cap	Cool, 4°C	7 days until extraction, 40 days after
Nitrosamines	G, Teflon-lined cap	Cool, 4°C, 0.008% NA2S203 store in dark	40 days after extraction
PCBs, acrylonitrile	G, Teflon-lined cap	Cool, 4°C	40 days after extraction
Nitroaromatics and isophorone	G, Teflon-lined cap	Cool, 4°C, 0.008% Na2S2O3 store in dark	40 days after extraction
Polynuclear aromatic hydrocarbons	G, Teflon-lined cap	Cool, 4°C, 0.008% Na2S2O3 store in dark	40 days after extraction
Haloethers	G, Teflon-lined cap	Cool, 4°C, 0.008% Na2S2O3	40 days after extraction
Chlorinated hydrocarbons	G, Teflon-lined cap	Cool, 4°C	40 days after extraction
TCDD	G, Teflon-lined cap	Cool, 4°C, 0.008% Na2S2O3	40 days after extraction
Total organic halogens	G, Teflon-lined cap	Cool, 4°C, H2SO4 to pH <2	7 days

[1]Polyethylene (P) or Glass (G)

TABLE 2-1 (continued)

REQUIRED CONTAINERS, PRESERVATION TECHNIQUES, AND HOLDING TIMES

Name	Container[1]	Preservation	Maximum Holding Time
Pesticides Tests:			
Chlorinated insecticides	G, Teflon-lined cap	Cool, 4°C, pH 5-9	40 days after extraction
Organophosphate insecticides	G		
Phenoxy/phenol herbicides	G		
Radiological Tests:			
Alpha, beta and radium	P, G	HNO3 to pH <2	6 months

[1]Polyethylene (P) or Glass (G)

2.2.2.7 Sample Shipment

Ground water samples will be shipped to Biospherics, Inc. with the following procedure:

- Sample containers will be transported at 4°C in a sealed ice chest or other suitable container.
- Glass bottles will be separated in the shipping container by absorbent material to prevent breakage.
- Ice will be placed in separate plastic bags and sealed.
- All sample shipments will be accompanied by a Chain-of-Custody Form. The completed chain-of-custody forms will be enclosed in a plastic bag and taped to the inside lid of the cooler.
- Signed and dated chain-of-custody seals will be placed on all coolers prior to shipping.
- The consultant's office, name, and address will be placed in the shipping container.

2.2.2.8 Chain of Custody

Upon transfer of sample possession to subsequent custodians, a Chain-of-Custody Form will be signed by the persons transferring custody of the sample container. Upon receipt of samples at the laboratory, the shipping container seal will be broken and the condition of the samples will be recorded by the receiver. Chain-of-Custody records will be included in the analytical report prepared by the laboratory.

2.2.2.9 Field Sampling Data

HWA's Field Monitoring Data Sheets will be used during ground water sampling for this study. These sheets provide documentation of the following information:

- Project name
- Sample number
- Location and sampling source
- Time and date of sampling
- Pertinent well data, e.g., depth-to-water
- Sampling method, e.g., dedicated pump
- Preservation
- Volume, type and number of containers
- Weather
- Field measured parameters of pH, temperature and specific conductance
- Sample storage
- Comments, e.g., appearance of sample

In each sampling event, four samples at each well shall be collected and quadruplicate measurements of pH and specific conductance shall be made. A field blank, trip blank and a blind duplicate sample will be analyzed for all parameters agreed upon by USEPA and USDA.

2.3 SOIL CORE SAMPLING

2.3.1 Soil Sampling Locations

Additional background soils will be obtained from the field to southwest of monitor well MW-B and from the orchard to the west of monitor well MW-C. At each location, three soil samples will be collected from depths of 6 to 9 feet (or similar to depths of drainfield samples).

2.3.2 Sample Collection

Soil samples will be collected at each depth (6 inches, 24 inches and 48 inches) using a JMC Zero Contaminant Soil Tube with acetate sleeves. The sample tube is 12 inches long and 1 inch in diameter. A sledge hammer will be used to drive the sampler to the required sampling depths. Soil cores will be obtained at 6-inch intervals at the designated depth. Alternatively, should the JMC Zero Contamination Soil Tube not be able to penetrate the cobbley soils, a standard nominal 3-inch diameter stainless steel hand auger will be used to drill and obtain a soil sample.

The acetate soil sleeve from each interval will be extruded from the sampler. End caps will be placed on the tube. The entire "sealed tube" will then be wrapped in aluminum foil. The entire sample will then be placed in a plastic baggie and sealed. The sealed baggie will be placed in a cooler with ice for delivery to the laboratory. Alternatively, should the stainless steel auger be used to drill and obtain the soil sample, then the samples will be removed using a stainless steel spoon and placed in glass airtight jars. All samples for organic analysis will be collected first and placed in jars with minimum headspace. The jars will be placed in a cooler with ice for delivery to the laboratory.

The samples collected each day will be delivered or shipped to the testing laboratory that same evening. These samples will be kept cool in an iced cooler until delivery to the lab. The Chain of Custody information will be recorded on Biospherics, Inc.'s Chain of Custody Form. The Field Monitoring Data Sheet will be used to record important data during field sampling. These data include sampling methodologies and equipment. Soil samples will be delivered to Biospherics, Inc., Beltsville, Maryland, for the testing of parameters agreed upon between USEPA and USDA.

Soil excavations/borings will be field logged and described in terms of color, grain size, organic matter, moisture content, density and other appropriate characteristics. These descriptions will be recorded on boring/soil logs.

2.3.3 Equipment Decontamination

All sampling equipment will be steam cleaned prior to collecting the first soil sample at the site. Sampling equipment will also be steam cleaned between the collection of each sample to lower the risk of cross-contamination between sample depths and locations. The additional decontamination procedure will also be followed:

- Steam clean or high pressure wash
- Hexane rinse (optional to remove persistent contaminants)
- Distilled water rinse
- Dilute HCl acid rinse (pH <2)
- Distilled water rinse
- Methanol rinse (1:1 solution)
- Distilled water rinse
- Final distilled water rinse

One sample set per day of the final distilled water rinse from the soil sampling equipment decontamination procedure will be obtained and submitted for testing.

All cleaning solutions, wash water and rinse water will remain on-site until soil sampling results are known.

2.3.4 Excavation Backfilling

After the completion of soil sampling, the excavations are to be backfilled. The bottom of the drain tile excavation will first be lined with plastic sheeting. The stockpiled "clean" soil will be used to fill the excavations. The surface will be covered with gravel, where appropriate.

2.4 SEPTIC TANK

Labeling, preservation and transport of sediment samples will be documented on the Chain of Custody and Field Monitoring Data Sheets.

All sampling equipment will be decontaminated between samples with the following sequence:

- Steam cleaning or high pressure wash
- Non-phosphate detergent wash
- Distilled water rinse
- Acid (HCl) wash (pH < 2)
- Distilled water rinse
- Methanol rinse
- Steam cleaning or high pressure water wash
- Final distilled water rinse

2.5 CALIBRATION OF FIELD INSTRUMENTS

Field instruments are to be calibrated each day of sampling in the field.

2.6 ANALYSIS OF GROUND WATER SAMPLES

2.6.1 Analytical Methods

Refer to Project Plan under each task description.

2.6.2 Data Management

This project-specific Data Management program will address the data sources, data processing and data applications for the YARL project. Raw data generated in the field or received from analytical laboratories will be entered into a computerized data base for management. Criteria for analytical data validation includes checks for internal consistency, transmittal errors, laboratory protocol and overall adherence to the QA/QC. Quality control sample results and information documented on field sampling forms will be used to interpret and evaluate laboratory and field analytical results.

2.6.3 Precision

Precision is a measure of data variation when more than one measurement is taken on the same sample. The precision estimate for duplicate measurements can be expressed as the relative percent difference (RPD):

$$RPD = \frac{c_1 - c_2 \times 100}{c}$$

where c_1 = concentration for replicate #1; c_2 = concentration for replicate #2; c = mean concentration.

Acceptable precision limits are based on past databases as defined by the EPA. Laboratory duplicate measurements will be obtained once per round of ground water samples.

2.6.4 Accuracy

Accuracy of laboratory analysis is assessed by measuring standard reference material and spiked samples. Standard reference materials are utilized to calibrate laboratory measurement instruments.

Spike recovery is determined by splitting a sample into two portions, spiking one portion with a known quantity of a constituent of interest, and analyzing both portions. Spike recovery is expressed as percent recovery:

$$\text{Percent Recovery} = \frac{c}{cs} \times 100$$

where c = measured concentration increase; cs = known concentration increase

Acceptable spike recovery limits are based on past data sets as defined by EPA.

2.6.5 Completeness

Completeness is an estimate of the amount of valid data obtained from the analytical measurement system for a given set of data. The percent completeness is defined as the number of samples analyzed that meet the data quality goals divided by the total number of samples analyzed multiplied by 100.

2.6.6 Performance and System Audits

Performance and system audits are designed to assess the capability of the measurement systems.

An on-site review of field quality assurance procedures will be conducted by a member of the SE/E staff who is otherwise not associated with the project. The SE/E quality assurance auditor will observe and document field activities and present findings/recommendations to the Project Manager in a summary report. Appropriate auditor recommendations will be incorporated into field procedures at the discretion of the Project Manager.

Analytical laboratories contracted for this study will be required to participate in performance and system audits conducted by the National Enforcement Investigating Center (NEIC) or consistent with the USEPA Environmental Monitoring Systems/Support Laboratories. The results of these audits will be made available to the Project Manager.

2.6.7 Corrective Action

Corrective action measures generally lie within two areas of project management: 1) concerns associated with sample collection, sample handling, equipment failures, data processing, data management, and/or data analysis; and 2) non-conformance or non-compliance of analytical laboratories with QA requirements.

The HWA project manager will be kept informed of all potentially major quality assurance problems. The project manager will be notified immediately by telephone should a field or laboratory quality assurance problem arise that may potentially jeopardize the use of collected data. Corrective action will be taken by the project manager when field methods are determined to be inappropriate or analytical data found to be outside predetermined limits of acceptability. Corrective actions may include a proce-

dural change, additional performance and system audits, meeting with laboratory personnel and in extreme cases obtaining a new subcontractor. The USDA COTR will be notified should corrective action be necessary.

2.7 SITE HEALTH AND SAFETY

A Health and Safety Plan will be written before sampling and site cleanup begin. It is anticipated that most sampling will be done in Level D protection. (Refer to Site Health and Safety Plan.)

APPENDIX A

FIELD MONITORING/SAMPLING PROCEDURES SUMMARY

The following is a step-by-step procedure that will be followed during ground water monitoring and sampling activities.

A. WATER LEVEL MONITORING

1. Arrive at site
2. Record weather and temperature
3. Monitor headspace in well with photoionizing device
4. Check for immiscibles - **interface probe**
5. Measure static water levels in each well - **Sinco probe**
6. Measure total depth of well
7. Calculate volume of water in well
8. Measure pH, conductivity and temperature - **BK pDS Meter**
9. Decontaminate probe(s) between wells

B. WELL PURGING/GROUND WATER SAMPLING - High-yield Wells

1. Using dedicated pump, remove 3-5X well volumes
2. Purge water pumped into 55-gallon drum
3. Allow water level to equilibrate
4. Measure pH, conductivity and temperature
5. Collect samples in order specified in Plan
6. Retest pH, conductivity and temperature
7. Replace well cap/lock
8. Place labelled samples in shipment container

C. WELL PURGING/GROUND WATER SAMPLING - Low-yield Wells

1. Using dedicated pump, remove 3-5X well volumes
   or to dryness (Note if water is cascading into well)
2. Allow water level to equilibrate (up to 2 hours)
3. Measure pH, conductivity and temperature
4. Collect samples in order specified in Plan
5. Retest pH, conductivity and temperature
7. Replace well cap/lock
8. Place labelled samples in shipment container

APPENDIX B

LABORATORY METHOD DETECTION LIMITS, QUANTITATION LIMITS, PRECISION AND ACCURACY

ANALYTICAL PARAMETERS AND DETECTION LIMITS

Parameter	Method Detection Limit*	
	Soil (mg/kg)	Water (μg/L, unless otherwise indicated)
Base Neutral/Acid Extractable Organics (Methods: Water SW 3510/SW 8270, Soil SW 3550/SW 8270)		
Acenaphthene	330	10
Acenaphthylene	330	10
Anthracene	330	10
Benzo(a)anthracene	330	10
Benzo(a)pyrene	330	10
Benzo(b)fluoranthene	330	10
Benzo(k)fluoranthene	330	10
Benzo(ghi)perylene	330	10
Benzoic Acid	1700	50
Benzyl Alcohol	330	10
Bis(2-ethylhexyl)phthalate	330	10
Bis(2-chloroethoxy)methane	330	10
Bis(2-chloroethyl)ether	330	10
Bis(2-chloroisopropyl)ether	330	10
4-Bromophenyl phenyl ether	330	10
Butyl benzyl phthalate	330	10
p-Chloroaniline	330	10
2-Chloronaphthalene	330	10
2-Chlorophenol	330	10
4-Chlorophenyl phenyl ether	330	10

Parameter	Method Detection Limit*	
	Soil (mg/kg)	Water (µg/L, unless otherwise indicated)
Base Neutral/Acid Extractable Organics (Methods: Water SW 3510/SW 8270, Soil SW 3550/SW 8270)		
Chrysene	330	10
Dibenzo(a,h)anthracene	330	10
Di-n-butyl phthalate	330	10
1,2-Dichlorobenzene	330	10
1,3-Dichlorobenzene	330	10
1,4-Dichlorobenzene	330	10
3,3-Dichlorobenzidine	660	20
2,4-Dichlorophenol	330	10
Diethylphthalate	330	10
2-4-Dimethylphenol	330	50
Dimethyl phthalate	330	10
2-4-Dinitrophenol	1700	50
Di-n-octylphthalate	330	10
2-methyl-4,6-dinitrophenol	1700	50
2,4-Dinitrotoluene	330	10
2,6-Dinotrotoluene	330	10
Fluoranthene	330	10
Fluorene	330	10
Hexachlorobenzene	330	10
Hexachlorobutadiene	330	10

Parameter	Method Detection Limit*	
	Soil (mg/kg)	Water (µg/L, unless otherwise indicated)
Base Neutral/Acid Extractable Organics (Methods: Water SW 3510/SW 8270, Soil SW 3550/SW 8270)		
Hexachlorocyclopentadiene	330	10
Hexachloroethane	330	10
Indeno(1,2-c,d)pyrene	330	10
Isopharone	330	10
2-Methylnaphthalene	330	10
Naphthalene	330	10
m-nitroaniline	1700	50
o-nitroaniline	1700	50
p-nitroaniline	1700	50
Nitrobenzene	330	10
2-Nitrophenol	330	10
4-Nitrophenol*	1700	50
n-Nitrosodi-n-propylamine	330	10
N-nitrosodiephenylamine	330	10
Ortho-cresol	330	10
Para-cresol	330	10
Pentachlorophenol*	1700	50
Phenanthrene	330	10
Phenol	330	10
1,2,4-Trichlorobenzene	330	10
2,4,5-Trichlorophenol	1700	50

Parameter	Method Detection Limit*	
	Soil (mg/kg)	Water (µg/L, unless otherwise indicated)
Base Neutral/Acid Extractable Organics (Methods: Water SW 3510/SW 8270, Soil SW 3550/SW 8270)		
2,4,6-Trichlorophenol	330	10

* Referenced USEPA Contract Laboratory Program SOW 02/88.

ANALYTICAL PARAMETERS AND DETECTION LIMITS

Parameter	Method Detection Limit*	
	Soil (µg/kg)	Water (µg/L, unless otherwise indicated)
Volatile Organics (Method (8240)		
Acetone	50	10
Benzene	5	5
Bromodichloromethane	5	5
Bromoform	5	5
Bromomethane	10	10
2-Butanonen (MEK)	100	100
Carbon disulfide	5	5
Carbon tetrachloride	5	5
Chlorobenzene	5	5
Chloroethane	10	10
2-Chloroethyl vinyl ether	10	10
Chloroform	5	5
Chloromethane	10	10
Dibromochloromethane	5	5
1,1-Dichloroethane	25	5
1,2-Dichloroethane	5	5

Parameter	Method Detection Limit*	
	Soil (µg/kg)	Water (µg/L, unless otherwise indicated)
Volatile Organics (Method (8240)		
1,1-Dichloroethene	5	5
trans-1,2-Dichloroethene	5	5
trans-1,3-dichloropropene	5	5
1,2-Dichloropropane	5	5
cis-1,3-Dichloropropene	5	5
Ethylbenzene	5	5
2-Hexanone	50	50
Methylene chloride	5	5
4-Methyl-2-pentanone (MIBK)	50	50
1,2,2-Tetrachloroethane	5	5
Styrene	5	5
Tetrachloroethene	5	5
Toluene	5	5
1,1,1-Trichloroethane	5	5
1,1,2-Trichloroethane	5	5
Trichloroethane	5	5
Trichlorofluoromethane	5	5
Vinyl acetate	50	50
Vinyl chloride	10	10
Xylenes (total, all isomers)	5	5

* Referenced USEPA Contract Laboratory Program SOW 02/88.

ANALYTICAL PARAMETERS AND DETECTION LIMITS

Parameter	Quantitation Limit*	
	Soil (µg/kg)	Water (µg/L, unless otherwise indicated)
Base Neutral/Acid Extractable Organics (Methods: Water SW 3510/SW 8270, Soil SW 3550/SW 8270)		
Acenaphthene	330	10
Acenaphthylene	330	10
Anthracene	330	10
Benzo(a)anthracene	330	10
Benzo(a)pyrene	330	10
Benzo(b)fluoranthene	330	10
Benzo(k)fluoranthene	330	10
Benzo(ghi)perylene	330	10
Benzoic Acid	1700	50
Benzyl Alcohol	330	10
Bis(2-ethylhexyl)phthalate	330	10
Bis(2-chloroethoxy)methane	330	10
Bis(2-chloroethyl)ether	330	10
Bis(2-chloroisopropyl)ether	330	10
4-Bromophenyl phenyl ether	330	10
Butyl benzyl phthalate	330	10
p-Chloroaniline	330	10
2-Chloronaphthalene	330	10
2-Chlorophenol	330	10
4-Chlorophenyl phenyl ether	330	10

Parameter	Quantitation Limit*	
	Soil (µg/kg)	Water (µg/L, unless otherwise indicated)
Base Neutral/Acid Extractable Organics (Methods: Water SW 3510/SW 8270, Soil SW 3550/SW 8270)		
Chrysene	330	10
Dibenzo(a,h)anthracene	330	10
Di-n-butyl phthalate	330	10
1,2-Dichlorobenzene	330	10
1,3-Dichlorobenzene	330	10
1,4-Dichlorobenzene	330	10
3,3-Dichlorobenzidine	660	20
2,4-Dichlorophenol	330	10
Diethylphthalate	330	10
2-4-Dimethylphenol	330	50
Dimethyl phthalate	330	10
2-4-Dinitrophenol	1700	50
Di-n-octylphthalate	330	10
2-methyl-4,6-dinitrophenol	1700	50
2,4-Dinitrotoluene	330	10
2,6-Dinotrotoluene	330	10
Fluoranthene	330	10
Fluorene	330	10
Hexachlorobenzene	330	10
Hexachlorobutadiene	330	10

Parameter	Quantitation Limit*	
	Soil (µg/kg)	Water (µg/L, unless otherwise indicated)
Base Neutral/Acid Extractable Organics (Methods: Water SW 3510/SW 8270, Soil SW 3550/SW 8270)		
Hexachlorocyclopentadiene	330	10
Hexachloroethane	330	10
Indeno(1,2-c,d)pyrene	330	10
Isopharone	330	10
2-Methylnaphthalene	330	10
Naphthalene	330	10
m-nitroaniline	330	10
o-nitroaniline	330	10
p-nitroaniline	1700	50
Nitrobenzene	330	10
2-Nitrophenol	330	10
4-Nitrophenol*	1700	50
n-Nitrosodi-n-propylamine	330	10
N-nitrosodiephenylamine	330	10
Ortho-cresol	330	10
Para-cresol	330	10
Pentachlorophenol*	1700	50
Phenanthrene	330	10
Phenol	330	10
1,2,4-Trichlorobenzene	330	10
2,4,5-Trichlorophenol	1700	50

Parameter	Quantitation Limit*	
	Soil (µg/kg)	Water (µg/L, unless otherwise indicated)
Base Neutral/Acid Extractable Organics (Methods: Water SW 3510/SW 8270, Soil SW 3550/SW 8270)		
2,4,6-Trichlorophenol	330	10

* Referenced USEPA Contract Laboratory Program.

Parameter	Quantitation Limit*	
	Soil (µg/kg)	Water (µg/L, unless otherwise indicated)
Volatile Organics (Method (8240)		
1,1-Dichloroethene	5	5
trans-1,3-dichloropropene	5	5
trans-1,3-dichloropropene	5	5
1,2-Dichloropropane	5	5
cis-1,3-Dichloropropene	5	5
Ethylbenzene	5	5
2-Hexanone	50	50
Methylene chloride	5	5
4-Methyl-2-pentanone (MIBK)	50	50
1,2,2-Tetrachloroethane	5	5
Styrene	5	5
Tetrachloroethene	5	5
Toluene	5	5
1,1,1-Trichloroethane	5	5
1,1,2-Trichloroethane	5	5
Trichloroethane	5	5
Trichlorofluoromethane	5	5
Vinyl acetate	50	50
Vinyl chloride	10	10
Xylenes (total, all isomers)	5	5

* Referenced USEPA Contract Laboratory Program SOW 02/88.

Parameter	Method Detection Limit[a]	
	Water µg/L	Low Soil[c] µg/kg
Pesticides (Methods: Water SW 3510/8080, Soil SW3550/8080)		
alpha-BHC	0.05	8.0
beta-BHC	0.05	8.0
delta-BHC	0.05	8.0
gamma BHC (Lindane)	0.05	8.0
Heptachlor	0.05	8.0
Aldrin	0.05	8.0
Heptachlor epoxide	0.05	8.0
Endosulfan I	0.05	8.0
Dieldrin	0.10	16.0
4,4'-DDE	0.10	16.0
Endrin	0.10	16.0
Endosulfan II	0.10	16.0
4,4'-DDD	0.10	16.0
Endosulfan sulfate	0.10	16.0
4,4'-DDT	0.10	16.0
Methoxychlor	0.5	80.0
Endrin ketone	0.10	16.0
alpha-Chlordane	0.5	80.0
gamma-Chlordane	0.5	80.0
Toxaphene	1.0	160.0
Aroclor-1016	0.5	80.0
Aroclor-1221	0.5	80.0
Aroclor-1232	0.5	80.0
Aroclor-1242	0.5	80.0
Aroclor-1248	0.5	80.0

Parameter	Method Detection Limit[d]	
	Water µg/L	Low Soil[c] µg/kg
Pesticides (Methods: Water SW 3510/8080, Soil SW3550/8080)		
Aroclor-1254	1.0	160.0
Aroclor-1260	1.0	160.0

c Medium Soil/Sediment Contract Required Quantitation Limits (CRQL) for Pesticide/PCB TCL compounds are 15 times the individual Low Soil/Sediment CRQL.

* Specific method detection limits are highly matrix dependent. the quantitation limits listed herein are provided for guidance and may not always be achievable.

** Method detection limits listed for soil/sediment are based on wet weight. The method detection limits calculated by the laboratory for soil/sediment, calculated on dry weight basis as required by the contract, will be higher.

d Referenced USEPA Contract Laboratory Program SOW 02/88.

Parameter	Quantitation Detection Limit[d]	
	Water µg/L	Low Soil[c] µg/kg
Pesticides (Methods: Water SW 3510/8080, Soil SW3550/8080)		
alpha-BHC	0.05	8.0
beta-BHC	0.05	8.0
delta-BHC	0.05	8.0
gamma-BHC (Lindane)	0.05	8.0
Heptachlor	0.05	8.0
Aldrin	0.05	8.0
Heptachlor epoxide	0.05	8.0
Endosulfan I	0.05	8.0
Dieldrin	0.10	16.0
4,4'-DDE	0.10	16.0
Endrin	0.10	16.0
Endosulfan II	0.10	16.0
4,4'-DDD	0.10	16.0
Endosulfan sulfate	0.10	16.0
4,4'-DDT	0.10	16.0
Methoxychlor	0.5	80.0
Endrin ketone	0.10	16.0
alpha-Chlordane	0.5	80.0
gamma-Chlordane	0.5	80.0
Toxaphene	1.0	160.0
Aroclor-1016	0.5	80.0
Aroclor-1221	0.5	80.0
Aroclor-1232	0.5	80.0
Aroclor-1242	0.5	80.0
Aroclor-1248	0.5	80.0

Parameter	Quantitation Detection Limit[a]	
	Water µg/L	Low Soil[c] µg/kg
Pesticides (Methods: Water SW 3510/8080, Soil SW3550/8080)		
Aroclor-1254	1.0	160.0
Aroclor-1260	1.0	160.0

c Medium Soil/Sediment Contract Required Quantitation Limits (CRQL) for Pesticide/PCB TCL compounds are 15 times the individual Low Soil/Sediment CRQL.

* Specific method detection limits are highly matrix dependent. the quantitation limits listed herein are provided for guidance and may not always be achievable.

** Method detection limits listed for soil are based on wet weight. The method detection limits calculated by the laboratory for soil/sediment, calculated on dry weight basis as required by the contract, will be higher.

d Referenced USEPA Contract Laboratory Program SOW 02/88.

ANALYTICAL PARAMETERS AND DETECTION LIMITS

Parameter	Method Detection Limit*	
	Soil (mg/kg)	Water (µg/L, unless otherwise indicated)
Pesticides (Methods: Water SW 3510/8140, Soil SW 3550/SW 8140)		
TEPP	7.95	7.7
Fluorate	0.13	0.21
Disulfoton	0.16	0.30
Methyl parathion	0.21	0.17
Malathion	0.21	0.16
Dursban/Ethylparathion**	0.16	1.2
Diazinon	0.16	0.18
Fenthion**	0.15	
Aziphosmethyl	1.5	2.1
Paraoxon	2.8	1.1

*MDL's determined according to the procedure described in Appendix B to 40 CFR Part 136.

**Dursban and ethyl parathion coeluted in the soils method validation run. Fenthion, dursban and ethyl parathion coeluted in the water validation run.

ANALYTICAL PARAMETERS AND DETECTION LIMITS

Parameter	Quantitation Limit*	
	Soil (mg/kg)	Water (µg/L, unless otherwise indicated)
Pesticides (Methods: Water SW 3510/8140, Soil SW 3550/SW 8140)		
TEPP	1.0	5.0
Phorate	0.04	0.20
Disulfoton	0.04	0.20
Methyl parathion	0.04	0.20
Malathion	0.04	0.20
Dursban	0.04	0.20
Ethyl parathion	0.04	0.20
Diazinon	0.04	0.20
Fenthion	0.04	0.20
Azinphosmethyl	0.16	0.80
Paraoxon	0.40	2.0

* Referenced SW846, Test Methods for Evaluating Solid Waste, Third Edition.

ANALYTICAL PARAMETERS AND DETECTION LIMITS

Parameter	Method Detection Limit*	
	Soil (mg/kg)	Water (µg/L, unless otherwise indicated)
Herbicides (Methods: Water SW /8150, Soil SW /SW 8150)		
2,4-D	0.12	0.62
2,4,5-TP (Silves)	0.08	0.62
Dinoseb	0.06	0.66

*MDL's determined according to the procedure described in Appendix B to 40CFR Part 136.

ANALYTICAL PARAMETERS AND DETECTION LIMITS

Parameter	Quanitation Limit*	
	Soil (mg/kg)	Water (µg/L, unless otherwise indicated)
Herbicides (Methods: Water SW /8150, Soil SW /SW 8150)		
2,4-D	0.020	0.10
2,4,5-TP (Silvex)	0.020	0.10
Dinoseb	0.20	0.10

* Referenced SW846, Test Methods for Evaluating Solid Waste, Third Edition.

TABLE 1-11

Matrix Spike Recovery Limits*

Fraction	Matrix Spike Compound	Water %Recovery	%RPD	Soil/ %Recovery	RPD
8240					
VOA*	1,1-dichloroethane	61-165	14	59-172	22
VOA	Trichloroethene	71-120	14	62-137	24
VOA	Chlorobenzene	75-130	13	60-133	21
VOA	Toluene	76-125	13	59-139	21
VOA	Benzene	76-127	11	66-142	21
8270					
BN*	1,2,4-trichlorobenzene	39-98	28	38-107	23
BN	Acenaphthene	46-118	31	31-137	19
BN	2,4-dinitrotoluene	24-96	38	28-89	47
BN	Pyrene	26-127	31	35-142	36
BN	N-nitroso-di-n-propylamine	41-116	38	41-126	38
BN	1,4-dichlorobenzene	36-97	28	28-104	27
8270					
Acid	Pentachlorophenol	9-103	50	17-109	47
Acid	Phenol	12-89	42	26-90	35
Acid	2-chlorophenol	27-123	40	25-102	50
Acid	4-chloro-3-methylphenol	23-97	42	26-103	33
Acid	4-nitrophenol	10-80	50	11-114	50
8080					
Pest	Lindane	56-123	15	46-127	50
Pest	Heptachlor	40-131	20	35-130	31

TABLE 1-11

Matrix Spike Recovery Limits*
(Continued)

Fraction	Matrix Spike Compound	Water %Recovery	%RPD	Soil/ %Recovery	%RPD
8080					
Pest	Aldrin	40-120	22	36-132	43
Pest	Dieldrin	52-126	18	31-134	38
Pest	Endrin	56-121	21	42-139	45
Pest	4,4'-DDT	38-127	27	23-134	50
8140					
Pest	TEPP	40-160	25	25-175	40
Pest	Phorate	40-160	25	25-175	40
Pest	Disulfoton	40-160	25	25-175	40
Pest	Methyl parathion	40-160	25	25-175	40
Pest	Malathion	40-160	25	25-175	40
Pest	Dursban/Ethyl parathion	40-160	25	25-175	40
Pest	Diazinon	40-160	25	25-175	40
Pest	Fenthion	40-160	25	25-175	40
Pest	Azinophosmethyl	40-160	25	25-175	40
Pest	Paraozon	40-160	25	25-175	40
8150					
Herb	2,4-D	40-160	25	25-175	40
Herb	2,4,5-TP (Silvex)	40-160	25	25-175	40
Herb	2,4,5-T	40-160	25	25-175	40

INORGANIC ANALYSIS PLAN - WATER

Parameter	Method	Method[a] Detection Limit (µg/l)	Quantification Limits (µg/l)	Precision[b] %RPD	Accuracy[c] %REC
Aluminum	6010	200	45	20	75-125
Antimony	6010	60	32	20	75-125
Arsenic	6010	10	53	20	75-125
Barium	6010	200	2	20	75-125
Beryllium	6010	5	0.3	20	75-125
Cadmium	6010	5	4	20	75-125
Calcium	6010	5000	10	20	75-125
Chromium	6010	10	7	20	75-125
Cobalt	6010	50	7	20	75-125
Copper	6010	25	6	20	75-125
Iron	6010	100	7	20	75-125
Lead	6010	3	42	20	75-125
Magnesium	6010	5000	30	20	75-125
Manganese	6010	15	2	20	75-125
Mercury	7470	0.2	0.2	20	75-125
Nickel	6010	40	15	20	75-125
Potassium	6010	5000	1000	20	75-125

INORGANIC ANALYSIS PLAN - WATER
(Continued)

Parameter	Method	Method[a] Detection Limit (µg/l)	Quantification Limits (µg/l)	Precision[b] %RPD	Accuracy[c] %REC
Selenium	6010	5	75	20	75-125
Silver	6010	10	7	20	75-125
Sodium	6010	5000	29	20	75-125
Thallium	6010	10	40	20	75-125
Tin	6010	30	30	20	75-125
Vanadium	6010	50	8	20	75-125
Zinc	6010	20	2	20	75-125
Cyanide	9010	10	10	20	75-125

a Method detection limit is defined as contract required detection limit and comes from USEPA CLP protocol.
b Precision is defined as relative percent difference (RPD) of sample and replicate.
c Accuracy is defined as matrix spike recovery.

ALTERNATIVE METHOD-WATER

Parameter	Method	Method[a] Detection Limit (µg/l)	Quantification Limits (µg/l)	Precision[b] %RPD	Accuracy[c] %REC
Arsenic	7060	10	10	20	75-125
Selenium	7740	5	5	20	75-125
Lead	7421	3	3	20	75-125
Thallium	7841	10	10	20	75-125

a Method detection limit is defined as contract required detection limit and comes from USEPA CLP protocol.
b Precision is defined as relative percent difference (RPD) of sample and replicate.
c Accuracy is defined as matrix spike recovery.

INORGANIC ANALYSIS PLAN - SOIL

Parameter	Method	Method[a] Detection Limit (mg/kg)	Quantification Limits (mg/kg)	Precision[b] %RPD	Accuracy[c] %REC
Aluminum	6010	20.0	4.5	20	75-125
Antimony	6010	6.0	3.2	20	75-125
Arsenic	6010	1.0	5.3	20	75-125
Barium	6010	20	0.2	20	75-125
Beryllium	6010	0.5	0.03	20	75-125
Cadmium	6010	0.5	0.4	20	75-125
Calcium	6010	500	1.0	20	75-125
Chromium	6010	1.0	0.7	20	75-125
Cobalt	6010	5.0	0.7	20	75-125
Copper	6010	2.5	0.6	20	75-125
Iron	6010	10.0	0.7	20	75-125
Lead	6010	0.3	4.2	20	75-125
Magnesium	6010	500	3.0	20	75-125
Manganese	6010	1.5	0.2	20	75-125
Mercury	7471	0.02	0.02	20	75-125
Nickel	6010	4.0	1.5	20	75-125
Potassium	6010	500		20	75-125

INORGANIC ANALYSIS PLAN - SOIL
(Continued)

Parameter	Method	Method[a] Detection Limit (mg/kg)	Quantification Limits (mg/kg)	Precision[b] %RPD	Accuracy[c] %REC
Selenium	6010	0.5	7.5	20	75-125
Silver	6010	1.0	0.7	20	75-125
Sodium	6010	500	2.9	20	75-125
Thallium	6010	1.0	4.0	20	75-125
Tin	6010			20	75-125
Vanadium	6010	5.0	0.8	20	75-125
Zinc	6010	2.0	0.2	20	75-125
Cyanide	9010	1.0	1.0	20	75-125

a Method detection limit is defined as contract required detection limit and comes from USEPA CLP protocol.
b Precision is defined as relative percent difference (RPD) of sample and replicate.
c Accuracy is defined as matrix spike recovery.

ALTERNATIVE METHOD - SOIL

Parameter	Method	Method[a] Detection Limit (mg/kg)	Quantification Limits (mg/kg)	Precision[b] %RPD	Accuracy[c] %REC
Arsenic	7060	1.0	1.0	20	75-125
Selenium	7740	0.5	0.5	20	75-125
Lead	7421	0.3	0.3	20	75-125
Thallium	7841	1.0	1.0	20	75-125

a Method detection limit is defined as contract required detection limit and comes from USEPA CLP protocol.
b Precision is defined as relative percent difference (RPD) of sample and replicate.
c Accuracy is defined as matrix spike recovery.

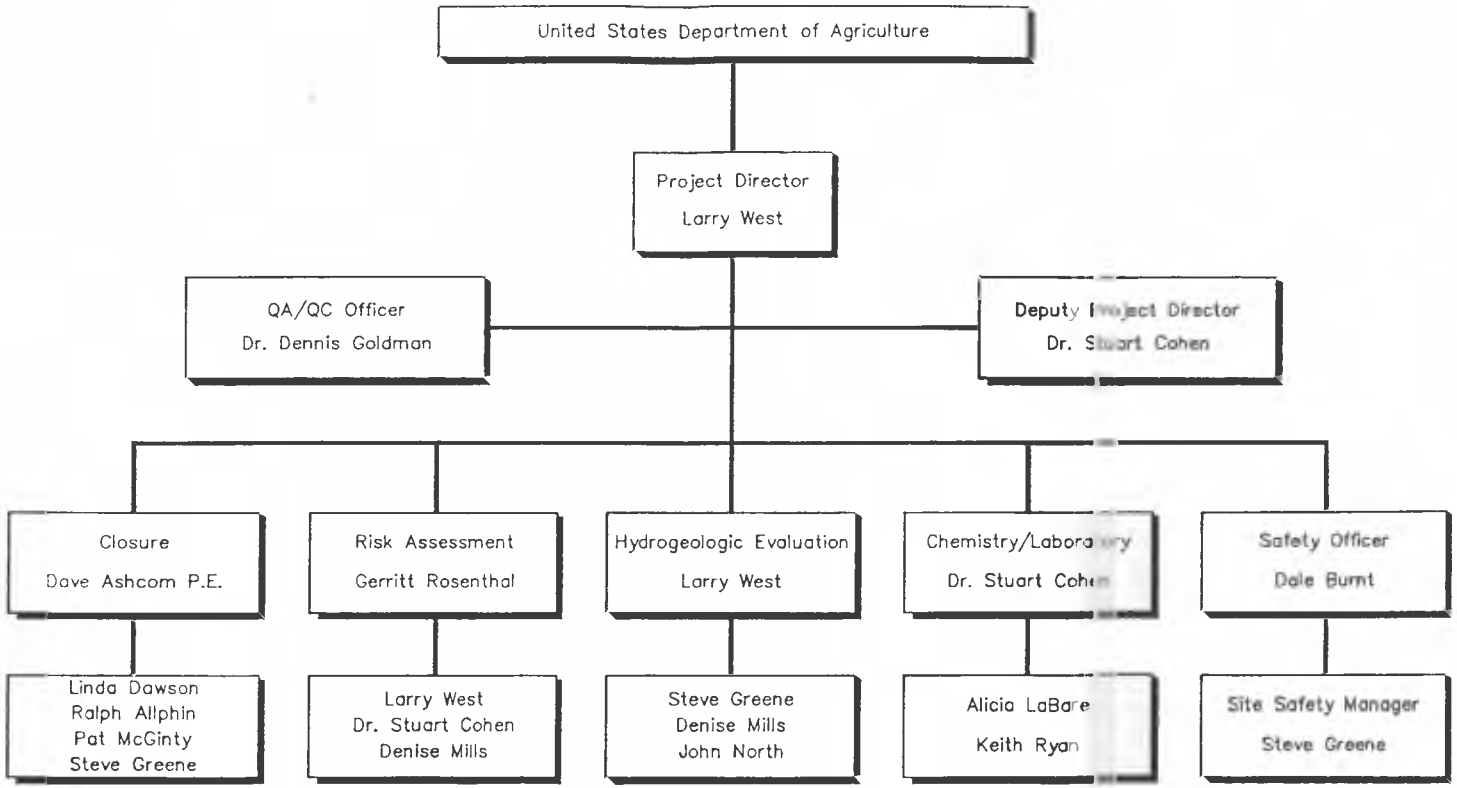
APPENDIX C

PROJECT SCHEDULE

Task Description
Contract Award
April 3, 1996
(Days)
(10)
April 23
(20)
(30)
May 14
(40)
(50)
June 4
(60)
June 25
July 5
(90)
August 4
(120)
August 24
(140)
November 21
(230)
Febuary 19, 1991
(320)
May 22
(410)
August 20
(500)
(520)
September 30 1991
(540)
1 – Critical Data Gap Analysis
2 – Prepare Project Plan
3 – Prepare Sampling & Analysis Plan
4 – Assess Uppermost Aquifer
5 – Develop Site Safety Plan
6 – Risk Assessment
7 – Remove and Dispose of Septic Tank Contents
8 – Excavate & Remove Septic Tank
9 – Assess Residual Contamination at Septic Tank
10 – Washdown Pad Inspection & Disposal
11 – Assess Residual Contamination under Washdown Pad
12 – Drainfield Area Soil Sampling
13 – Install Monitoring Wells
14 – Well Maintenance / Post Closure Monitoring
15 – Site Restoration
16 – Closure / Post Closure Certification
17 – Project Reporting / Documentation
18 – Project Management
Intense Effort
Intermittant Effort
Meetings
Progress Reports
Critical Data Gap Summary
4/23
Draft Project Plan
4/30
5/3
Final Project Plan
6/4
7/5
8/4
Closure Certification & Report
8/16
Well Construction Completion
8/20
8/24
Monitoring Report
11/21
Monitoring Report
2/19/91
Monitoring Report
5/22
Monitoring Report
8/20
9/20
Final Report &
9/30 Post Closure Certification
PROJECT SCHEDULE
YAKIMA AGRICULTURAL RESEARCH LABORATORY
HAZARDOUS WASTE SEPTIC SYSTEM DISPOSAL
Hong West & Associate

APPENDIX D

PROJECT ORGANIZATION CHART



PROJECT ORGANIZATION
YAKIMA AGRICULTURAL RESEARCH LABORATORY
HAZARDOUS WASTE SEPTIC SYSTEM DISPOSAL

SECTION IV

FIGURES

U.S.G.S. YAKIMA WEST QUADRANGLE **SCALE 1:25,000**

SITE LOCATION PLAN

YAKIMA AGRICULTURAL RESEARCH LABORATORY

FIGURE 1

HONG WEST & ASSOCIATES

LETTER OF TRANSMITTAL

P.O. Box 596, Lynnwood, Washington 98046 • (206) 774-0106

DATE	JOB NO.
4-27-90	90042

ATTENTION: Alvin Humphrey

RE: YARL

TO: USDA, ARS, PWAO
800 Buchanan Street
Albany, CA. 94710

GENTLEMEN:

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
2	4-23-90		Draft - Project Plan

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval

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☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ 19_____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS _____

COPY TO _____

SIGNED: JP for Larry West

If enclosures are not as noted, kindly notify us at once.